P321-E122-04EN

PRIMEPOWER

USER'S MANUAL

PRIMEPOWER200
PRIMEPOWER400
PRIMEPOWER600

FUJITSU

Preface

This manual explains the features, functions, installation and additions to the PRIMEPOWER200, PRIMEPOWER400 and PRIMEPOWER600 servers and is intended for experienced users with a basic knowledge of UNIX and UNIX servers.

This preface describes the following items:

- SAFE OPERATION
- Introduction to Chapters
- Related Manuals
- Warning Message Conventions
- Operating Environment
- Prohibited Uses
- FCC Class A Notice
- Trademarks
- Copyright

SAFE OPERATION

Using This Manual

This manual contains important information regarding the use and handling of this product. Read this manual thoroughly. Pay special attention to the section "Important Warnings". Use the product according to the instructions and information available in this manual.

FUJITSU makes every efforts to prevent users and bystanders from being injured or from suffering damage to their property. Use the product according to this manual.

Introduction to Chapters

The structure of this manual is as follows:

CHAPTER 1 Features of the PRIMEPOWER Servers

Chapter 1 gives an overview of the features of the PRIMEPOWER of servers.

CHAPTER 2 PRIMEPOWER200 Pedestal Server

Chapter 2 gives an overview of the PRIMEPOWER200 Pedestal Server, names and functions of parts, preparations for use, and expansion.

CHAPTER 3 PRIMEPOWER200 Rackmount (4U) Server

Chapter 3 gives an overview of the PRIMEPOWER200 Rackmount (4U) Server, names and functions of parts, preparations for use, and expansion.

CHAPTER 4 PRIMEPOWER400 Pedestal Server

Chapter 4 gives an overview of the PRIMEPOWER400 Pedestal Server, names and functions of parts, preparations for use, and expansion.

CHAPTER 5 PRIMEPOWER400 Rackmount (4U) Server

Chapter 5 gives an overview of the PRIMEPOWER400 Rackmount (4U) Server, names and functions of parts, preparations for use, and expansion.

CHAPTER 6 PRIMEPOWER400 Rackmount (10U) Server

Chapter 6 gives an overview of the PRIMEPOWER400 Rackmount (10U) Server, names and functions of parts, preparations for use, and expansion.

CHAPTER 7 PRIMEPOWER600 Pedestal Server

Chapter 7 gives an overview of the PRIMEPOWER600 Pedestal Server, names and functions of parts, preparations for use, and expansion.

CHAPTER 8 PRIMEPOWER600 Rackmount (10U) Server

Chapter 8 gives an overview of the PRIMEPOWER600 Rackmount (10U) Server, names and functions of parts, preparations for use, and expansion.

CHAPTER 9 Expansion Disk Cabinet

Chapter 9 gives an overview of the Expansion Disk Cabinet, names and functions of parts, installation, configuration of the disk drive bay, and hot-swapping of redundant components.

CHAPTER 10 Expansion File Unit Type-2

Chapter 10 gives an overview of the Expansion File Unit Type-2, names and functions of parts, installation, configuration of the disk drive bay, and hot-swapping of redundant components.

CHAPTER 11 Internal I/O Units

Chapter 11 gives an overview of how to use the various internal I/O devices.

CHAPTER 12 RCI Commands

Chapter 12 gives an overview of the RCI commands.

CHAPTER 13 Troubleshooting

Chapter 13 helps the user isolate the causes of system failures, and suggests possible solutions.

CHAPTER 14 Glossary

Chapter 14 explains the meaning of the various specialized terms used in this manual.

Related Manuals

The following manuals contain related material:

"Enhanced Support Facility User’s Guide"

"Enhanced Support Facility Installation Guide"

"Enhanced Support Facility Machine Administration Instructions"

Warning Message Conventions

A warning message consists of a label and statements. The following warning message types are displayed to prevent users and bystanders from being injured or from suffering property damage.

⚠WARNING

This indicates a hazardous situation that could result in death or serious injury if the user does not perform the procedure correctly.

⚠CAUTION

This indicates a hazardous situation that could result in minor or moderate personal injury if the user does not perform the procedure correctly. It also indicates that damage to the product or other property may occur of the user does not perform the procedure correctly.

IMPORTANT

This indicates information that could help the user use the product more efficiently.

How warning messages are displayed in the manual

Each warning message is accompanied by an indicator of the warning type, followed by a more detailed explanation.

(Example)

⚠WARNING

Electric shock/fire

If you detect an abnormality such as heat build-up, smoke or foul odor, immediately turn the AC main line switch OFF, or disconnect the power cable, and contact a service engineer. Failure to do so might cause electric shock or fire.

Important warning messages are summarized under "Important Warnings".

Operating Environment

This product has been designed and produced to be used safely by general users in a general office environment. When using this product, observe the installation and handling precautions described in this manual.

Prohibited Uses

This Product is designed, developed and manufactured as contemplated for general use, including without limitation, general office use, personal use and household use, but is not designed, developed and manufactured as contemplated for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could lead directly to death, personal injury, severe physical damage or other loss (hereinafter "High Safety Required Use"), including without limitation, nuclear power core control, airplane control, air traffic control, mass transport operation control, life support, weapon launching control. You shall not use this Product without securing the sufficient safety required for the High Safety Required Use. Hence, if these products are used in such hazardous environments, FUJITSU LIMITED and SUN MICROSYSTEMS, INC. Do not warrant them at all. If you wish to use this Product for High Safety Required Use, please consult with our sale person in charge before such use. Documents produced by FUJITSU may contain technology controlled under the Foreign Exchange and Foreign Trade Control Law of Japan. Those documents containing such technology should not be exported from Japan or transferred to anyone other than residents of Japan without first obtaining license from the Ministry of International Trade and Industry of Japan in accordance with the above law.

FCC Class A Notice

CAUTION
This equipment has been tested and found to comply with the limits for a Class digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This product is compliant with harmonics guidelines.

Trademarks

- Solaris is a trademark of Sun Microsystems Inc.
- SPARC64 is a registered trademark or trademark of SPARC International, Inc. in the United States and other countries, under license by Fujitsu Ltd.

Copyright

All rights reserved. This product and related documentation are protected by copyright and distributed under licenses already restricting its use, copying, distribution, and recompilation. No part of this product or related documentation may be reproduced in any form by any means without prior written authorization of Fujitsu Limited and its licensors, if any.

The contents of this manual may be revised without prior notice.

All Rights Reserved, Copyright (c) FUJITSU LIMITED 2001

Safety Cautions

Important Warnings

The following types of warnings are found in this manual:

⚠WARNING This indicates a hazardous situation could result in death or serious injury if the user does not perform the procedure correctly.

Normal Operation Warnings

task	Warning
Electric shock/fire	Do not deform, damage or strip the power cable. Doing so might cause electric shock or fire.
Electric shock/fire	If you detect an abnormality such as heat build-up, smoke or foul odor, immediately turn the main line switch OFF, or disconnect the power cable, and contact a service engineer. Failure to do so might cause electric shock or fire.

⚠CAUTION

This indicates a hazardous situation that could result in minor or moderate personal injury if the user does not perform the procedure correctly. Also, damage to the product or other property may occur.

Normal Operation Cautions

Task	Caution
Data destruction:	Pressing the RESET switch while the system is running may cause data to be lost.
Data destruction:	Install "Enhanced Support Facility" before operating the system. Without this package, incorrect front panel operations and hardware errors may cause the system to shutdown or cause data to be lost.
Data destruction:	Pressing the REQUEST switch while the system is running may cause data to be lost.
Data destruction:	Do not turn the console (unit connected to serial port) on after turning the PRIMEPOWER on, or turn the console off while the PRIMEPOWER is on. Doing so might cause system malfunction and cause data to be lost.
Data destruction:	Before turning the power off, check the following points. Otherwise, data may be lost. Are there any currently executing programs? Are there any current users? Are floppy disks or tape cartridges still inserted in their drives? If necessary, back up files before turning the power off.
Data destruction:	If improper commands are used at the ok prompt, data may be lost. If you need to use any other commands except those given in this manual, you should fully understand the function and usage of the command before using it.
Data destruction:	Except in any emergency, never turn the AC main line switch or disconnect the power cable while the PRIMEPOWER is turned on. If you do, data in the disk drive may be lost.
Data destruction:	Before you eject a floppy disk, be sure to either execute the Solaris eject command, or perform eject operation in the application you are using. Failure to do so might cause data to be lost. Also, do not eject a floppy disk while the access LED is on. Doing so may damage the disk.
Unit damage/ Data destruction:	Pay attention to the following points when handling the hard disk units. If these precautions are not observed, the magnetic disk unit may be damaged or data lost. Do not subject the unit to exceeds impact. Do not bring the unit near to equipment (motors, speakers, etc.) that generate strong magnetic fields. Do not store the unit at locations likely to cause condensation inside the unit or at locations subject to sudden changes in temperature or humidity.
Unit damage:	Do not connect I/O units to the maintenance port. Connecting I/Os to the SCF port may damage this unit.

Product Handling Cautions

Maintenance

⚠WARNING

The following operations on this product and options provided by FUJITSU should be performed by a service engineer, and should not be performed by the user. Otherwise, the user may create the risk of electric shock, injury or fire.

- New installation and moving of units
- Removal of the front, rear and side panel covers
- Mounting/removal of built-in option units
- Connection/disconnection of external interface cables
- Maintenance (repair and periodic diagnosis and maintenance)

⚠CAUTION

The following operations on this product and options provided by FUJITSU should be performed by a service engineer, and should not be performed by the user. Otherwise, the user may cause the products to malfunction.

- Unpacking of option adapter, etc. delivered to the customer
- Removal of the front panel, rear panel and side panel covers
- Mounting/removal of built-in option units
- Connection/disconnection of external interface cables
- Maintenance (repair and periodic diagnosis and maintenance)

Remodeling and Recycling of This Product

If this product is remodeled with secondhand parts,overhauled, or recycled as is, users and bystanders may be injured and property damaged unexpectedly.

CONTENTS

CHAPTER 1 Features of the PRIMEPOWER Servers 1

CHAPTER 2 PRIMEPOWER200 Pedestal Server 3

2.1 Overview . . . 4

2.2 Names and Functions of Parts . . . 5

2.2.1 Front side . . . 5

2.2.2 Control panel . . . 6

2.2.3 Rear side . . . 8

2.3 Preparations for Use . . . 10

2.3.1 Installation notes . . . 10

2.3.2 Installation specifications . . . 12

2.3.3 Connecting the console . . . 14

2.3.4 Turning the power on . . . 14

2.3.5 Turning the power off . . . 16

2.3.6 Installing the Enhanced Support Facility package . . . 17

2.3.7 How to enable/disable the break signal . . . 18

2.3.8 LAN expansion note . . . 19

2.4 Expanding the Server Unit . . . 20
2.4.1 Adding CPU modules . . . 21
2.4.2 Adding memory modules . . . 21
2.4.3 Adding hard disk drives . . . 22
2.4.4 Adding PCI cards . . . 24

CHAPTER 3 PRIMEPOWER200 Rackmount (4U) Server 25

3.1 Overview . . . 26
3.2 Names and Functions of Parts . . . 27
3.2.1 Front side . . . 27
3.2.2 Control panel . . . 27
3.2.3 Rear side . . . 30
3.3 Preparations for Use . . . 31
3.3.1 Installation notes . . . 31
3.3.2 Installation specifications . . . 33
3.3.3 Connecting the console . . . 34
3.3.4 Turning the power on . . . 35
3.3.5 Turning the power off . . . 37
3.3.6 Installing the Enhanced Support Facility package . . . 38
3.3.7 How to enable/disable the break signal . . . 39
3.3.8 LAN expansion note . . . 40
3.4 Expanding the Server Unit . . . 41
3.4.1 Adding power supply units . . . 42
3.4.2 Adding CPU modules . . . 42
3.4.3 Adding memory modules . . . 43
3.4.4 Adding hard disk drives . . . 43
3.4.5 Adding PCI cards . . . 44

CHAPTER 4 PRIMEPOWER400 Pedestal Server 45

4.1 Overview . . . 46
4.2 Names and Functions of Parts . . . 47
4.2.1 Front side . . . 47
4.2.2 Control panel . . . 48
4.2.3 Rear side . . . 51
4.3 Preparations for Use . . . 52
4.3.1 Installation notes . . . 52
4.3.2 Installation specifications . . . 53
4.3.3 Connecting the console . . . 55
4.3.4 Turning the power on . . . 55
4.3.5 Turning the power off . . . 57
4.3.6 Installing the Enhanced Support Facility package . . . 58
4.3.7 How to enable/disable the break signal . . . 59
4.3.8 LAN expansion note . . . 60
4.4 Expanding the Server Unit . . . 61
4.4.1 Adding power supply units . . . 62
4.4.2 Adding CPU modules . . . 63
4.4.3 Adding memory modules . . . 63
4.4.4 Adding hard disk drives . . . 64
4.4.5 Adding PCI cards . . . 65

CHAPTER 5 PRIMEPOWER400 Rackmount (4U) Server 67

5.1 Overview . . . 68
5.2 Names and Functions of Parts . . . 68
5.2.1 Front side . . . 69
5.2.2 Control panel . . . 69
5.2.3 Rear side . . . 72

5.3 Preparations for Use . . . 73
5.3.1 Installation notes . . . 73
5.3.2 Installation specifications . . . 75
5.3.3 Connecting the console . . . 76
5.3.4 Turning the power on . . . 77
5.3.5 Turning the power off . . . 78
5.3.6 Installing the Enhanced Support Facility package . . . 80
5.3.7 How to enable/disable the break signal . . . 80
5.3.8 LAN expansion note . . . 81
5.4 Expanding the Server Unit . . . 82
5.4.1 Adding power supply units . . . 84
5.4.2 Adding CPU modules . . . 85
5.4.3 Adding memory modules . . . 86
5.4.4 Adding hard disk drives . . . 86
5.4.5 Adding PCI cards . . . 87

CHAPTER 6 PRIMEPOWER400 Rackmount (10U) Server 89

6.1 Overview . . . 90
6.2 Names and Functions of Parts . . . 91
6.2.1 Front side . . . 91
6.2.2 Control panel . . . 92
6.2.3 Rear side . . . 94
6.3 Preparations for Use . . . 96
6.3.1 Installation notes . . . 96
6.3.2 Installation specifications . . . 99
6.3.3 Connecting the console . . . 100
6.3.4 Turning the power on . . . 101
6.3.5 Turning the power off . . . 103

6.3.6 Installing the Enhanced Support Facility package . . . 104
6.3.7 How to enable/disable the break signal . . . 105
6.3.8 LAN expansion note . . . 106
6.4 Expanding the Server Unit . . . 107
6.4.1 Adding power supply units . . . 110
6.4.2 Adding CPU modules . . . 111
6.4.3 Adding memory modules . . . 111
6.4.4 Adding hard disk drives . . . 112
6.4.5 Adding PCI cards . . . 113

CHAPTER 7 PRIMEPOWER600 Pedestal Server 115

7.1 Overview . . . 116
7.2 Names and Functions of Parts . . . 117
7.2.1 Front side . . . 117
7.2.2 Control panel . . . 118
7.2.3 Rear side . . . 121
7.3 Preparations for Use . . . 122
7.3.1 Installation notes . . . 122
7.3.2 Installation specifications . . . 124
7.3.3 Connecting the console . . . 126
7.3.4 Turning the power on . . . 126
7.3.5 Turning the power off . . . 128
7.3.6 Installing the Enhanced Support Facility package . . . 129
7.3.7 How to enable/disable the break signal . . . 130
7.3.8 LAN expansion note . . . 131
7.4 Expanding the Server Unit . . . 132
7.4.1 Adding power supply units . . . 134
7.4.2 Adding CPU modules . . . 135

7.4.3 Adding memory modules . . . 135
7.4.4 Adding hard disk drives . . . 136
7.4.5 Adding PCI cards . . . 137

CHAPTER 8 PRIMEPOWER600 Rackmount (10U) Server 139

8.1 Overview . . . 140
8.2 Names and Functions of Parts . . . 141
8.2.1 Front side . . . 141
8.2.2 Control panel . . . 142
8.2.3 Rear side . . . 144
8.3 Preparations for Use . . . 146
8.3.1 Installation notes . . . 146
8.3.2 Installation specifications . . . 148
8.3.3 Connecting the console . . . 149
8.3.4 Turning the power on . . . 150
8.3.5 Turning the power off . . . 151
8.3.6 Installing the Enhanced Support Facility package . . . 152
8.3.7 How to enable/disable the break signal . . . 153
8.3.8 LAN expansion note . . . 154
8.4 Expanding the Server Unit . . . 155
8.4.1 Adding power supply units . . . 158
8.4.2 Adding CPU modules . . . 158
8.4.3 Adding memory modules . . . 160
8.4.4 Adding hard disk drives . . . 160
8.4.5 Adding PCI cards . . . 162

CHAPTER 9 Expansion Disk Cabinet 165

9.1 Overview . . . 166

9.2 Names and Functions of Parts . . . 166
9.2.1 Front side . . . 167
9.2.2 Rear side . . . 169
9.3 Preparations for Use . . . 171
9.3.1 Installation notes . . . 171
9.3.2 Installation specifications . . . 172
9.4 Disk Drive Configuration . . . 174
9.5 Hot-swapping Redundant Components . . . 175
9.5.1 Power supply units . . . 175
9.5.2 Hard disk drives . . . 176

CHAPTER 10 Expansion File Unit Type-2 177

10.1 Overview . . . 178
10.2 Names and Functions of Parts . . . 178
10.2.1 Front side . . . 178
10.2.2 Rear side . . . 179
10.3 Preparations for Use . . . 180
10.3.1 Installation notes . . . 180
10.3.2 Installation specifications . . . 182
10.4 Disk Drive Configurations . . . 182
10.5 Hot-swapping Redundant Components . . . 183
10.5.1 Power supply units . . . 183
10.5.2 Hard disk drives . . . 184

CHAPTER 11 Internal I/O Units 185

11.1 Hard Disk Drives . . . 186
11.1.1 SCSI ID . . . 186
11.1.2 Handling precautions . . . 186

11.1.3 Formatting hard disk drives . . . 186
11.1.4 Backing up data . . . 187
11.1.5 Hot-swapping hard disk drives . . . 187
11.2 CD-ROM Drive . . . 188
11.2.1 Names and functions of parts . . . 188
11.2.2 CD-ROM discs . . . 189
11.2.3 CD-ROM disc handling precautions . . . 189
11.2.4 Inserting a CD-ROM disc . . . 190
11.2.5 Ejecting a CD-ROM disc . . . 190
11.3 DAT Drive (DDS3) . . . 191
11.3.1 Names and functions of parts . . . 191
11.3.2 SCSI ID . . . 192
11.3.3 OS settings . . . 193
11.3.4 Data cartridges . . . 194
11.3.5 Data cartridge handling precautions . . . 195
11.3.6 Write-protecting a data cartridge . . . 196
11.3.7 Loading a data cartridge . . . 196
11.3.8 Ejecting a data cartridge . . . 196
11.3.9 Cleaning the tape heads . . . 197
11.4 DAT Drive (DDS4) . . . 198
11.4.1 Names and functions of parts . . . 198
11.4.2 SCSI ID . . . 199
11.4.3 OS settings . . . 200
11.4.3.1 PRIMEPOWER200 Non-Pedestal Servers . . . 200
11.4.3.2 PRIMEPOWER200 Pedestal Servers . . . 201
11.4.4 Data cartridges . . . 203
11.4.5 Data cartridge handling precautions . . . 204
11.4.6 Write-protecting a data cartridge . . . 205
11.4.7 Loading a data cartridge . . . 205

11.4.8 Ejecting a data cartridge . . . 205
11.4.9 Cleaning the tape heads . . . 206
11.5 8mm Tape Drive . . . 207
11.5.1 Names and function of parts . . . 207
11.5.2 SCSI ID . . . 208
11.5.3 OS settings . . . 208
11.5.4 Data cartridges . . . 210
11.5.5 Data cartridge handling precautions . . . 210
11.5.6 Write-protecting a data cartridge . . . 211
11.5.7 Loading a data cartridge . . . 211
11.5.8 Ejecting a data cartridge . . . 212
11.5.9 Cleaning the tape heads . . . 212
11.6 DLT Tape Drive . . . 215
11.6.1 Names and functions of parts . . . 215
11.6.2 SCSI ID . . . 217
11.6.3 OS settings . . . 218
11.6.4 Data cartridge . . . 219
11.6.5 Data cartridge handling precautions . . . 220
11.6.6 Write-protecting a data cartridge . . . 221
11.6.7 Loading a data cartridge . . . 221
11.6.8 Ejecting a data cartridge . . . 222
11.6.9 Cleaning the tape heads . . . 223

CHAPTER 12 RCI Commands 227

12.1 Overview . . . 228
12.2 RCI Commands . . . 228

CHAPTER 13 Troubleshooting 231

13.1 Overview 232
13.2 Checking Errors from the ok Prompt 232
13.3 LCD Initial Diagnostics Sequence 233
13.4 SCF Error Messages 234
13.5 Post Error Messages 237

CHAPTER 14 Glossary 239

14.1 Glossary 240

ILLUSTRATIONS

Figure 2.1 PRIMEPOWER200 Pedestal Server . . . 4
Figure 2.2 Front of PRIMEPOWER200 Pedestal Server . . . 5
Figure 2.3 Control Panel . . . 6
Figure 2.4 Rear of PRIMEPOWER200 Pedestal Server . . . 8
Figure 2.5 Turning the power on . . . 15
Figure 2.6 Turning the power off . . . 17
Figure 2.7 PRIMEPOWER200 Pedestal Server Systemboard . . . 20
Figure 2.8 PRIMEPOWER200 Disk Drive Configuration . . . 22
Figure 2.9 Rear of PRIMEPOWER200 Pedestal Server showing position of PCI slots . . . 24

Figure 3.1 PRIMEPOWER200 Rackmount (4U) Server . . . 26
Figure 3.2 Front of PRIMEPOWER200 Rackmount (4U) Server . . . 27
Figure 3.3 Control Panel . . . 27
Figure 3.4 Rear of PRIMEPOWER200 Rackmount (4U) Server . . . 30
Figure 3.5 Turning the power on . . . 36
Figure 3.6 Turning the power off . . . 38
Figure 3.7 PRIMEPOWER200 Rackmount (4U) Systemboard . . . 41
Figure 3.8 Rear View of PRIMEPOWER200 Rackmount (4U) showing position of PCI slots . . . 44

Figure 4.1 PRIMEPOWER400 Pedestal Server . . . 46
Figure 4.2 Front of PRIMEPOWER400 Pedestal Server . . . 47
Figure 4.3 Control Panel . . . 48
Figure 4.4 Rear of PRIMEPOWER400 Pedestal Server . . . 51
Figure 4.5 Turning the power on . . . 56

Figure 4.6 Turning the power off . . . 58
Figure 4.7 PRIMEPOWER400 Pedestal Server Systemboard . . . 61
Figure 4.8 PRIMEPOWER400 Pedestal Server PCI boards . . . 62
Figure 4.9 Rear of PRIMEPOWER400 Pedestal Server showing position of PCI slots . . . 66

Figure 5.1 PRIMEPOWER400 Rackmount (4U) Server . . . 68
Figure 5.2 Front of PRIMEPOWER400 Rackmount (4U) Server . . . 69
Figure 5.3 Control Panel . . . 69
Figure 5.4 Rear of PRIMEPOWER400 Rackmount (4U) Server . . . 72
Figure 5.5 Turning the power on . . . 78
Figure 5.6 Turning the power off . . . 79
Figure 5.7 PRIMEPOWER400 Rackmount (4U) Systemboard . . . 83
Figure 5.8 Rear of PRIMEPOWER400 Rackmount (4U) showing position of PCI slots . . . 87

Figure 6.1 PRIMEPOWER400 Rackmount (10U) Server . . . 90
Figure 6.2 Front of PRIMEPOWER400 Rackmount (10U) Server . . . 91
Figure 6.3 Control Panel . . . 92
Figure 6.4 Rear of PRIMEPOWER400 Rackmount (10U) Server . . . 94
Figure 6.5 Turning the power on . . . 102
Figure 6.6 Turning the power off . . . 104
Figure 6.7 PRIMEPOWER400 Rackmount (10U) Systemboard . . . 108
Figure 6.8 PRIMEPOWER400 Rackmount (10U) PCI boards . . . 109
Figure 6.9 Rear of PRIMEPOWER400 Rackmount (10U) showing position of PCI slots . . . 113

Figure 7.1 PRIMEPOWER600 Pedestal Server . . . 116
Figure 7.2 Front of PRIMEPOWER600 Pedestal Server . . . 117
Figure 7.3 Control Panel . . . 118
Figure 7.4 Rear of PRIMEPOWER600 Pedestal Server . . . 121
Figure 7.5 Turning the power on . . . 127
Figure 7.6 Turning the power off . . . 129
Figure 7.7 PRIMEPOWER600 Pedestal Server Systemboard . . . 133
Figure 7.8 PRIMEPOWER600 Pedestal Server Expansion Systemboard (Option) . . . 134
Figure 7.9 Rear of PRIMEPOWER600 Pedestal Server showing position of PCI slots . . . 138

Figure 8.1 PRIMEPOWER600 Rackmount (10U) Server . . . 140
Figure 8.2 Front of PRIMEPOWER600 Rackmount (10U) Server . . . 141
Figure 8.3 Control panel . . . 142
Figure 8.4 Rear of PRIMEPOWER600 Rackmount (10U) Server . . . 144
Figure 8.5 Turning the power on . . . 150
Figure 8.6 Turning the power off . . . 152

Figure 8.7 PRIMEPOWER600 Rackmount (10U) Base Systemboard 156
Figure 8.8 PRIMEPOWER600 Rackmount (10U) Expansion Systemboard (Option) 157
Figure 8.9 Rear View of PRIMEPOWER600 Rackmount (10U) showing position of PCI slots 163

Figure 9.1 Front of Expansion Disk Cabinet 167
Figure 9.2 Rear of Expansion Disk Cabinet 169
Figure 9.3 Full Disk Drive Configuration of Expansion Disk Cabinet 174

Figure 10.1 Front of Expansion File Unit Type-2 178
Figure 10.2 Rear of Expansion File Unit Type-2 179
Figure 10.3 Full Disk Drive Configuration of Expansion File Unit Type-2 183
Figure 10.4 Disk Drive + Tape Drive Configuration of Expansion File Unit Type-2 183

Figure 11.1 Front Panel CD-ROM Drive 188
Figure 11.2 CD-ROM Disc Mark 189
Figure 11.3 Front Panel of DDS3 DAT Drive 191
Figure 11.4 DAT Data Cartridge Write-protection Tab 196
Figure 11.5 Front Panel of DDS4 DAT Drive 198
Figure 11.6 DAT Data Cartridge Write-protection Tab 205
Figure 11.7 Front Panel of 8mm Tape Drive 207
Figure 11.8 8mm Tape Drive Data Cartridge Write-protection Tab 211
Figure 11.9 Appearance of Cleaning Cartridge 214
Figure 11.10 Front Panel of DLT Tape Drive 215
Figure 11.11 Data Cartridge Write-protection Tab 221

Figure 13.1 Initial Diagnostics Sequence 233

TABLES

Table 1.1 Data protection method . . . 2

Table 2.1 MODE Switch Settings . . . 6
Table 2.2 Installation Specifications of the PRIMEPOWER200 Pedestal Server (1/2) . . . 12
Table 2.3 Installation Specifications of the PRIMEPOWER200 Pedestal Server (2/2) . . . 13
Table 2.4 Allowed CPU Module Configurations . . . 21
Table 2.5 PCI Slot Specifications . . . 24

Table 3.1 MODE Switch Settings . . . 28
Table 3.2 Installation Specifications of the PRIMEPOWER200 Rackmount (4U) Server (1/2) . . . 33
Table 3.3 Installation Specifications of the PRIMEPOWER200 Rackmount (4U) Server (2/2) . . . 34
Table 3.4 Allowed CPU Module Configurations . . . 42
Table 3.5 PCI Slot Specifications . . . 44

Table 4.1 MODE Switch Settings . . . 49
Table 4.2 Installation Specifications of the PRIMEPOWER400 Pedestal Server (1/2) . . . 53
Table 4.3 Installation Specifications of the PRIMEPOWER400 Pedestal Server (2/2) . . . 54
Table 4.4 Allowed CPU Module Configurations . . . 63
Table 4.5 PCI Slot Specifications . . . 65

Table 5.1 MODE Switch Settings . . . 70
Table 5.2 Installation Specifications of the PRIMEPOWER400 Rackmount (4U) Server (1/2) . . . 75
Table 5.3 Installation Specifications of the PRIMEPOWER400 Rackmount (4U) Server (2/2) . . . 76
Table 5.4 Allowed CPU Module Configurations . . . 85
Table 5.5 PCI Slot Specifications . . . 87

Table 6.1 MODE Switch Settings . . . 93
Table 6.2 Installation Specifications of the PRIMEPOWER400 Rackmount (10U) Server (1/2) . . . 99
Table 6.3 Installation Specifications of the PRIMEPOWER400 Rackmount (10U) Server (2/2) . . . 100
Table 6.4 Allowed CPU Module Configurations . . . 111
Table 6.5 PCI Slot Specifications . . . 113

Table 7.1 MODE Switch Settings . . . 119
Table 7.2 Installation Specifications of the PRIMEPOWER600 Pedestal Server (1/2) . . . 124
Table 7.3 Installation Specifications of the PRIMEPOWER600 Pedestal Server (2/2) . . . 125
Table 7.4 Allowed CPU Module Configurations . . . 135
Table 7.5 PCI Slot Specifications . . . 137

Table 8.1 MODE Switch Settings . . . 143
Table 8.2 Installation Specifications of the PRIMEPOWER600 Rackmount (10U) Server (1/2) . . . 148
Table 8.3 Installation Specifications of the PRIMEPOWER600 Rackmount (10U) Server (2/2) . . . 149
Table 8.4 Allowed CPU Module Configurations . . . 159
Table 8.5 PCI Slot Specifications . . . 162

Table 9.1 CHECK LED Indicator . . . 168
Table 9.2 Installation Specifications of the Expansion Disk Cabinet (1/2) . . . 172
Table 9.3 Installation Specifications of the Expansion Disk Cabinet (2/2) . . . 173

Table 10.1 CHECK LED . . . 179
Table 10.2 Installation Specification of Expansion File Unit Type-2 . . . 182

Table 11.1 DDS3 DAT Drive LED Indicators . . . 192
Table 11.2 DDS3 DAT Data cartridges . . . 194
Table 11.3 DAT Cleaning Cartridge . . . 197
Table 11.4 DAT Drive LED Indicators . . . 199
Table 11.5 DDS4 DAT Data cartridges . . . 203
Table 11.6 DAT Cleaning Cartridge . . . 206
Table 11.7 8mm Tape Unit LED States . . . 208
Table 11.8 Supported Data Formats (8mm Tape Drive) . . . 209
Table 11.9 Density Codes When Specifying Data Formats . . . 209
Table 11.10 8mm Data Cartridges . . . 210
Table 11.11 8mm Cleaning Cartridge . . . 213
Table 11.12 DLT Data Cartridges . . . 219
Table 11.13 DLT Cleaning Cartridge . . . 225

Table 12.1 List Of Commands . . . 228

Table 13.1 show-post-results Command . . . 232

Table 13.2 Power Supply Unit Configuration Error Messages 234
Table 13.3 Power Supply Unit, Fans, and Environmental Error Messages 235
Table 13.4 CPU Monitor Error Massages 235
Table 13.5 Lithium Battery Error Messages 236
Table 13.6 Other Error Massages 236
Table 13.7 Post Error Messages 237

1

Features of the PRIMEPOWER Servers

The features of the PRIMEPOWER servers are as follows:

High-performance SPARC64 GP Processors

- The SPARC64 GP is a high-performance processor with an out-of-order execution engine.
- The SPARC64 GP features high-speed arithmetic operations with high-precision Branch Prediction
- The SPARC64 GP supports a large external cache and on-chip cache.
- ECC (error correcting code) is used in both the on-chip and external caches.

High-performance Multi-Processor Platform

- Symmetric Multiprocessing (SMP) architecture (maximum number of CPUs varies from model to model).
- Memory interleaving (maximum number of interleaves varies from model to model).
- Implements a packet-based bus protocol, with a throughput of 1.3 to 1.6 GB/s per processor.
- A high-speed crossbar switched multiprocessor interface is used. This enables simultaneous operation of multiple processors, I/O and memory devices and faster data transfers.

High-speed I/O interface

The following high-speed I/O interfaces are provided as standard:

- 100Base-TX (100/10 Mbps auto-sensing)
- 64-bit PCI (Peripheral Component Interconnect) busses

High-performance, Large-capacity Storage Devices

- Ultra SCSI disk drives (10,000rpm) can be added (maximum number of drives varies from model to model).
- A CD-ROM drive is provided as standard.
- One DAT unit, 8mm tape drive or DLT tape drive can be added as an option (various tape drives are available, compatibility will vary from model to model).

Reliability, Availability and Serviceability (RAS) Features

- ECC or parity protects the data for components and interfaces.

Table 1.1 Data protection method

Components and interfaces	Data protection method
Processor (on-chip & external cache)	ECC (correct 1 bit and detect 2 bits)
Memory	ECC (correct 1 bit and detect 2 bits)
Data path	ECC (correct 1 bit and detect 2 bits)
Address path	Parity
I/O bus (PCI)	Parity
Processor operation	Monitoring by SCF service processor
Built-in basic SCSI, LAN	Parity, IP checksum

Note: ECC or parity does not protect the RS-232C serial interface and floppy disk.

- Power-on diagnostics are conducted on system components such as processors and memory.
- Automatic System Reconfiguration (ASR) isolates faulty hardware components such as processors and memory modules immediately after detection.
- A SCF (System Control Facility), which has an integrated service processor, monitors the operation of the SPARC64 GP processors, environmental temperatures, power and fans.
- Status of LEDs and messages on the LCD panel indicate the status when an error occurs.
- The RCI (Remote Cabinet Interface) allows control over power cycling of expansion I/O units, such as the Expansion Disk Cabinet and Expansion File Unit Type-2, and monitors for errors.
- Internal disk drives are hot-swappable. In addition, redundant power supplies and fans are supported for high availability. (PRIMEPOWER200 Pedestal Server does not support it.)
- Lockable cover panels to prevent unauthorized access to the internal I/O devices. (Rackmount type server does not support it.)

2

PRIMEPOWER200 Pedestal Server

This chapter gives an overview of the PRIMEPOWER200 Pedestal Server, names and functions of parts, preparations for use, and how to expand the server unit.

CONTENTS

2.1 Overview 4
2.2 Names and Functions of Parts 5
2.3 Preparations for Use 10
2.4 Expanding the Server Unit 20

2.1 Overview

The following describes the key features and appearance of the PRIMEPOWER200 Pedestal Server.

Key Features

- The server unit can be configured with up to two CPUs.
- Up to 16 gigabytes of memory can be mounted.
- Six PCI slots (2 x 33/66MHz + 4 x 33MHz) are provided.
- Up to eight UltraSCSI disk drives can be built in.
- One tape unit (DDS4 DAT, 8mm) can be installed.
- A CD-ROM drive is provided as standard.
- One 100Base-TX port, two serial ports (RS-232C) and one keyboard/mouse port are provided as standard.

Appearance

The following illustration shows the appearance of the PRIMEPOWER200 Pedestal Server.

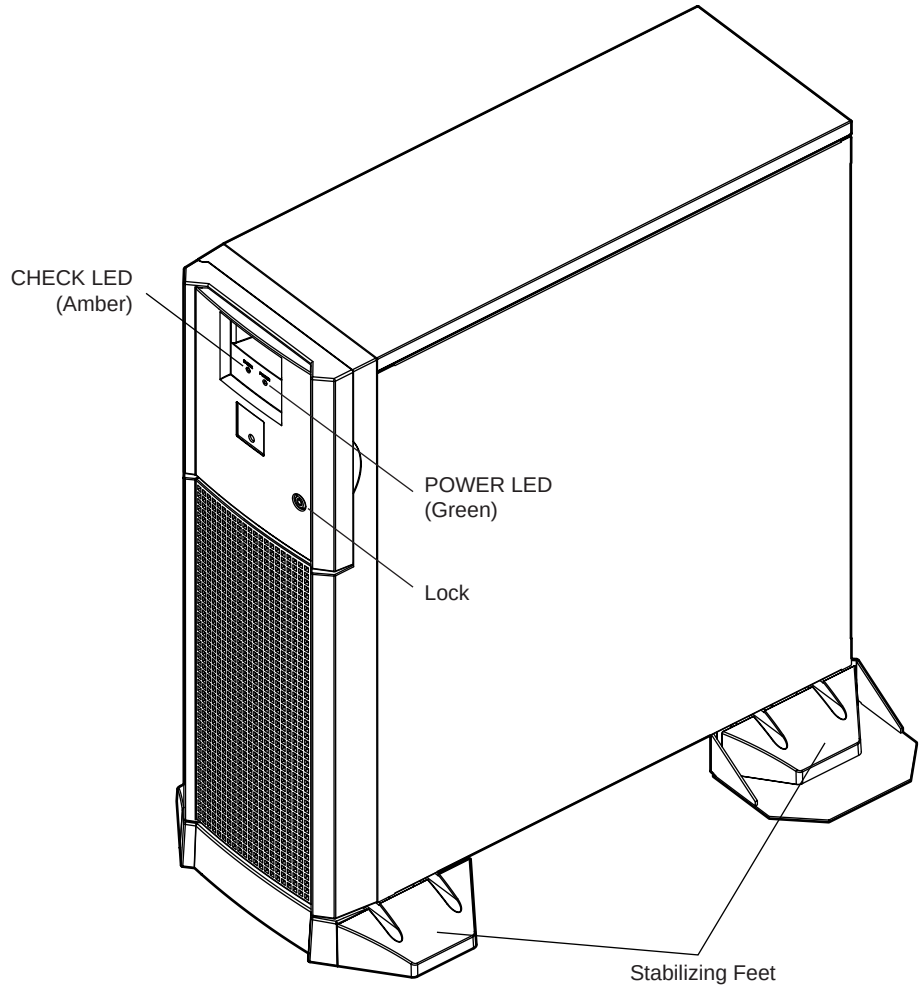


Figure 2.1 PRIMEPOWER200 Pedestal Server

2.2 Names and Functions of Parts

This section describes the names and functions of parts on the front, control panel and rear of the PRIMEPOWER200 Pedestal Server.

2.2.1 Front side

The names and functions of parts on the front of the PRIMEPOWER200 Pedestal Server are as follows.

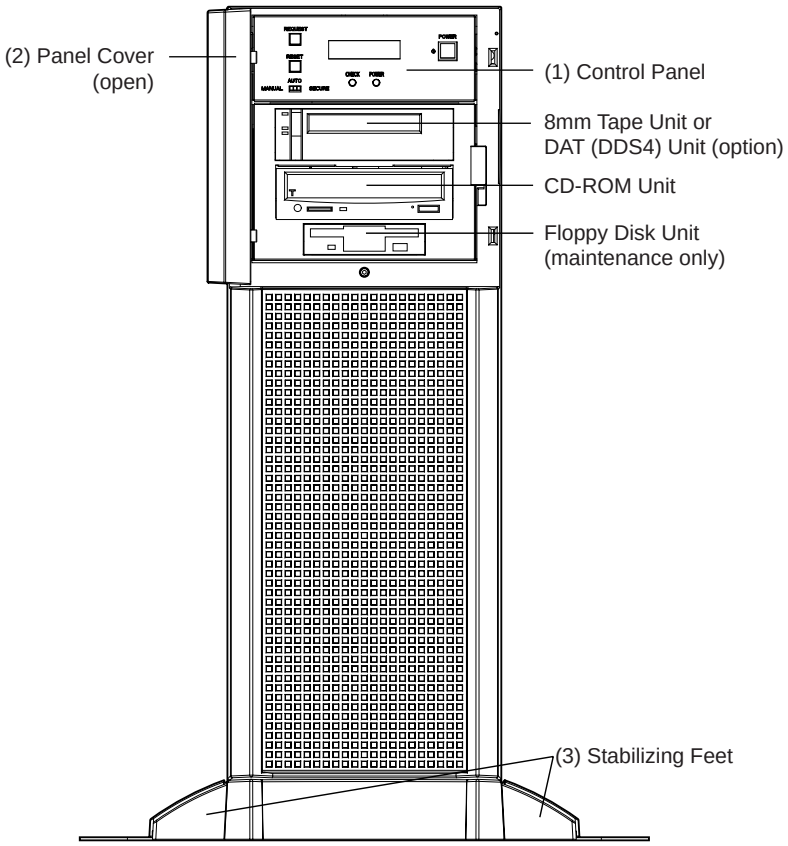


Figure 2.2 Front of PRIMEPOWER200 Pedestal Server

(1) Control panel

Contains various switches and indicator LEDs. See "2.2.2 Control Panel" for details.

(2) Panel cover

The panel cover can be opened to its right after being unlocked.

The LCD panel and the POWER and CHECK LEDs can be checked with the cover closed.

(3) Stabilizing feet

The stabilizing feet prevent the PRIMEPOWER200 Pedestal Server from falling over when pushed from the side or in an earthquake. When installing the PRIMEPOWER200 Pedestal Server, be sure to attach the stabilizing feet. If the Expansion Disk Cabinet is installed next to the PRIMEPOWER Server, install the stabilizing feet only on the side opposite to the Expansion Disk Cabinet.

2.2.2 Control panel

The PRIMEPOWER200 Pedestal Server is provided with the control panel shown in Figure 2.3 .

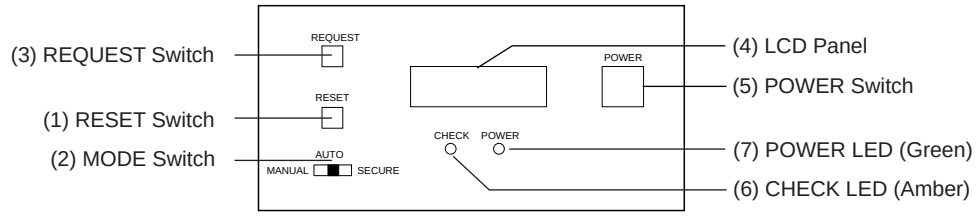


Figure 2.3 Control Panel

Note: To prevent erroneous operation, all push-button switches on the control panel are designed not to function unless held down for at least 0.3 seconds.

(1) RESET switch (push button)

⚠CAUTION

Data Destruction

Pressing the RESET switch while the system is running may cause data to be lost.

The RESET switch is used to reset the system to its initial state and is enabled or disabled by the MODE switch described in "(2) MODE Switch".

(2) MODE switch (3-position slider)

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

The MODE switch has three settings and is used to specify the run mode at power on or system reboot, and to whether the POWER, RESET and REQUEST switches are "enabled" or "disabled".

Table 2.1 MODE Switch Settings

MODE switch	POWER switch	RESET switch	REQUEST switch	Operation mode
MANUAL	Enabled	Enabled	Enabled	The bootup sequence stops at an ok prompt after initial diagnostics are completed. Use this mode to enter commands and make settings from the ok prompt when performing maintenance on the server unit.
AUTO	Enabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed.
SECURE	Disabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed. The TTY terminal "break" and keyboard "STOP+A" commands are disabled while Solaris is operating.

(3) REQUEST switch (push button)

⚠CAUTION

Data Destruction

Pressing the REQUEST switch while the system is running may cause data to be lost.

The REQUEST switch is for outputting a memory dump when an error has occurred in the system. Only service engineers should operate the REQUEST switch.

(4) LCD panel

The 16-digit x 2-row LCD panel displays the status of initial diagnostics performed when the power is turned on.

It also displays error messages when a hardware error has been detected. For details on error messages that may be displayed, see "13 Troubleshooting".

A LCD panel error message is cleared by one of the following:

- When the problem has been fixed
- When the power is next turned on
- When the AC main line switch is turned off

Some displayed error messages may be cleared when the RESET switch is pressed.

(5) POWER switch (push button)

The POWER switch instructs the system to turn the power on and off.

Power on and off of expansion units (such as the Expansion Disk Cabinet) is interlocked with the powering on and off of the PRIMEPOWER200 Pedestal Server.

Operation of the POWER switch varies according to the MODE switch and scftool (software contained in the "Enhanced Support Facility") settings. For details, see "(2) MODE switch" and the "Enhanced Support Facility User's Guide."

(6) CHECK LED

IMPORTANT

When the PRIMEPOWER200 Pedestal Server detects an error in the power line or abnormal temperatures, the CHECK LED blinks and the power is automatically turned off to prevent unit damage and ensure safety.

The CHECK LED blinks or lights up when the PRIMEPOWER200 Pedestal Server detects an error.

When the power is turned on, the CHECK LED lights up and then goes out. This is not an error. If the CHECK LED stays lit and does not go out at power on, this indicates an error.

When an error occurs, note down the details displayed on the LCD panel, and contact a service engineer.

(7) POWER LED

The POWER LED indicates the power state of the system. This LED lights up when the power is on, and goes out when the power is turned off.

2.2.3 Rear side

The names and functions of parts on the rear of the PRIMEPOWER200 Pedestal Server are as follows.

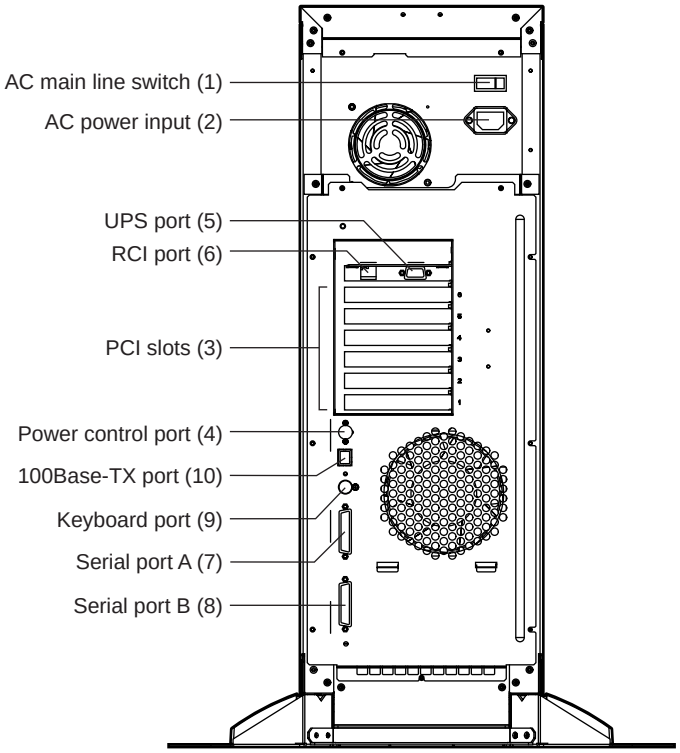


Figure 2.4 Rear of PRIMEPOWER200 Pedestal Server

(1) AC main line switch

The PRIMEPOWER200 Pedestal Server is turned on by the POWER switch on the front of the server unit when this switch is set to the "|" position.

(2) AC power input

Connect the power cable to this point.

(3) PCI slots

- PCI slots conform to the PCI local bus specification (Rev. 2.1).
- 64-bit bus, 33MHz (5.0 V) and 33/66MHz (3.3V) are supported.
- Both short cards (17.46 cm, 6.87 in.) and long cards (31.19 cm, 12.3 in.) are supported.

(4) Power control port (label : PC)

8-pin DIN for power control

(5) UPS port (label : UPS)

Dsub-9 pin for connecting the signal cable of an uninterruptible power supply

(6) RCI port (label : RCI)

RJ11 connector for connecting the RCI cable and terminator (provided with server unit)

(7), (8) Serial ports (label : SERIAL A/B)

Dsub-25 pin ports for connecting a console terminal when performing maintenance on the server unit using the RS-232C interface

(9) Keyboard port (label : KB)

8-pin DIN port for connecting the keyboard cable

(10) 100Base-TX port (label : LAN)

RJ45 connector automatically recognizes 10Mbps/100Mbps

2.3 Preparations for Use

This section describes the following:

- Installation notes and specifications
- Connecting the console
- Turning power on and off
- Installing the Enhanced Support Facility package
- Enabling/disabling the break signal
- LAN expansion note

2.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the PRIMEPOWER200 Pedestal Server may be damaged. Be sure to follow these notes.

- Do not block the ventilation holes.
- Do not install the PRIMEPOWER200 Pedestal Server where it will be exposed to sunlight or sources of heat.
- Do not install the PRIMEPOWER200 Pedestal Server in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the PRIMEPOWER200 Pedestal Server isolated from vibration. Install the PRIMEPOWER200 Pedestal Server on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the PRIMEPOWER200 Pedestal Server may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the PRIMEPOWER200 Pedestal Server. Do not use the top of the PRIMEPOWER200 Pedestal Server as a workspace.
- To prevent condensation in the PRIMEPOWER200 Pedestal Server, do not raise the ambient room temperature rapidly in winter.
  Use the PRIMEPOWER200 Pedestal Server only after it has warmed up sufficiently.
- Do not install the PRIMEPOWER200 Pedestal Server near EM noise generating devices such as photocopiers, air conditioners, or welders.
- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the PRIMEPOWER200 Pedestal Server to malfunction.
- When moving the PRIMEPOWER200 Pedestal Server, do not pull on the front cover. Otherwise, the Server may be damaged.

⚠CAUTION

Connect the ground before connecting any of the power supply lines. If all of the power cables are connected to a single power strip, high leakage current exceeding the stipulated value may leak through to the earth lead of the power strip.

If the power strip is not directly connected to the main distribution panel, use a power strip with an industrial plug.

2.3.2 Installation specifications

The following table shows the installation specifications for the PRIMEPOWER200 Pedestal Server.

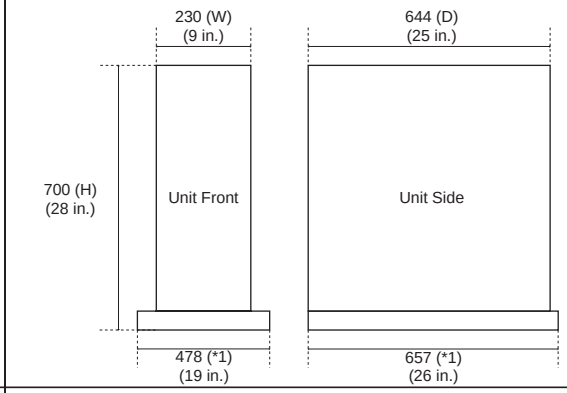
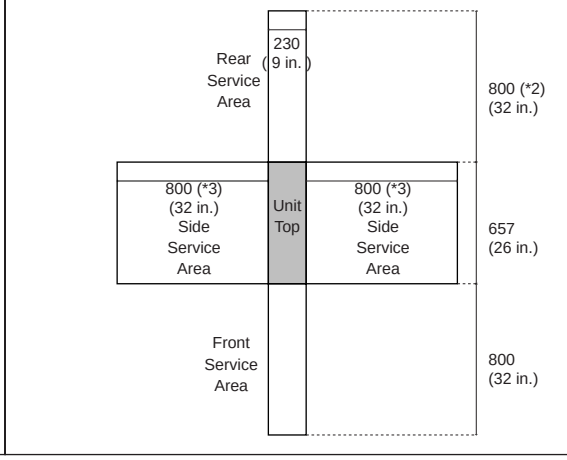
Table 2.2 Installation Specifications of the PRIMEPOWER200 Pedestal Server (1/2)

Item		Specification	
Weight		48 kg (105.96 lb.) (max.)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100 ~ 120V (±10%)	Single phase AC200 ~ 240V (±10%)
Max. Current		5.0 A (100V)	2.5 A (240V)
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*1)	
	Non-operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-operating	0.4 G	
Noise		47 db(A) (*2)	
Form Factor		Pedestal	

*1: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2: The indicated noise is the mean value of measurements obtained in a low-noise anechoic chamber. The actual noise measured at the installation site may be greater than the indicated value due to background noise and echoes.

Table 2.3 Installation Specifications of the PRIMEPOWER200 Pedestal Server (2/2)

Item	Specification
Unit Dimensions (units : mm)	
Service Areas (units : mm)	

*1: Including the Stabilizing Feet the width is 478 mm (19-inch) and the depth is 657mm (26-inch).

*2: If it is possible to move the Server Unit so that 800 mm (32-inch) or more space is available behind the unit when maintenance is performed, then 200mm (8-inch) of space is adequate is normal use. However, if optical cables are used, at least 300mm (12-inch) of space will be needed between the rear of the Unit and the wall.

*3: If it is possible to move the Server Unit so that 800mm (32-inch) or more space is available beside the Unit when maintenance is performed, then no space is required in normal use.

2.3.3 Connecting the console

A device such as a personal computer must be connected to the serial port to act as the console for a PRIMEPOWER200 Pedestal Server to which a display or keyboard is not connected. Pay attention to the following when connecting the console to the serial port on the PRIMEPOWER200 Pedestal Server.

Connect the serial cable:

Connect to serial A port.

Communication settings on the terminal:

Set to 8 bits, 1 stop bit, parity OFF, and 9600 baud.

2.3.4 Turning the power on

The following describes how to turn the power on.

⚠CAUTION

Data Destruction

Do not turn the console terminal (device connected to the serial port) on after turning the PRIMEPOWER Server. When the MODE switch is set to AUTO or MANUAL, the bootup sequence shifts to display of the ok prompt during Solaris operation according to the break signal. For this reason, data is sometimes lost.

IMPORTANT

- If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted (by operating the main line switch, etc.) the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.
- When the PRIMEPOWER Server is turned on, a self-diagnostics routine automatically verifies whether or not hardware errors are occurring. If this routine detects any hardware errors, system power is automatically turned off and on again (if the MODE switch on the control panel is set to AUTO or SECURE). This power off/on retry sequence is performed twice. In both retries, the routine checks for errors. If an error occurs in both cases, the routine judges that the system cannot be booted up and stops the system bootup sequence.

Procedure

1 Turn the AC main line power on.

2 Turn the power switches of the server unit (AC main line switch), console terminal and peripheral devices on.

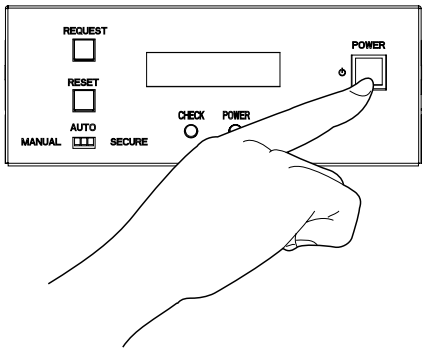


Figure 2.5 Turning the power on

3 Press the POWER switch on the control panel of the PRIMEPOWER200 Pedestal Server.
The POWER LEDs of the PRIMEPOWER Server and any peripheral devices connected via the RCI port should now light up.

Note: Operation of the POWER switch is disabled when the MODE switch is set to SECURE.
A keyboard power-on function is not supported.

2.3.5 Turning the power off

The following describes how to turn the power off.

⚠CAUTION

Data Destruction

Before turning the power off, check the answer to each of the following points is "No", or data may be lost:

- Are there any currently executing programs?
- Are there any current users?
- Are floppy disks or tape cartridges still inserted in their drives?

Backup files as necessary before turning the power off.

Also, do not turn off the console while the PRIMEPOWER Server is turned on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation potentially causing data to be lost.

IMPORTANT

- If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted (by operating the main line switch, etc.) the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.

Procedure

1. Press the POWER switch on the control panel of the PRIMEPOWER200 Pedestal Server.
2. Press the POWER switch again within five seconds (scftool default interval).
   This starts the system shutdown sequence. The power turns off after the system shuts down.
   For details on scftool, refer to the "User's Guide" included with the "Enhanced Support Facility."

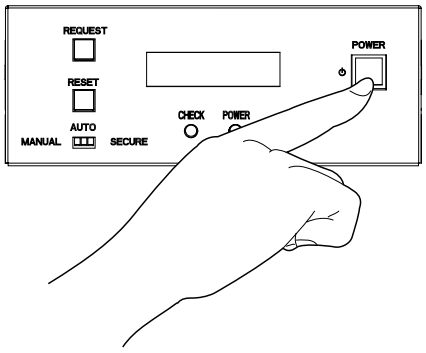


Figure 2.6 Turning the power off

3 Turn the power switches of peripheral devices off after the PRIMEPOWER200 Pedestal Server power has turned off.

2.3.6 Installing the Enhanced Support Facility package

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

With the PRIMEPOWER servers, be sure to install all of the programs provided with the "Enhanced Support Facility" to ensure the high reliability functions of the service processor. For details, refer to the "User's Guide" included with the "Enhanced Support Facility."

2.3.7 How to enable/disable the break signal

⚠CAUTION

Data Destruction

If improper commands are used at the ok prompt, data may be lost. If you need to use any command except those shown in this manual, you should fully understand the function and usage of the command before using it.

Data is sometimes lost as the bootup sequence shifts to display of the ok prompt during system operation in response to a break signal from the console terminal connected to the serial port or the STOP+A command from the keyboard.

To prevent this kind of response to a break signal arriving from the serial port or the STOP+A command from the keyboard, make the following settings using the set-fw-options command shown below from the ok prompt, and then set the MODE switch on the control panel to the SECURE mode.

How to disable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting.
The factory default is that nothing is set.

```
ok  print-fw-options
fw-options =
```

2 Use the set-fw-options command to set the value (no-break) for disabling the break signal and STOP command.

```
ok  set-fw-options no-break
fw-options = no-break
```

3 Use the print-fw-options command to make sure that no-break is correctly set.

```
ok  print-fw-options
fw-options = no-break
```

How to enable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting values. If the no-break shown below is not displayed, the break signal and STOP+A command are already enabled.

```
ok  print-fw-options
fw-options = no-break
```

2 Use the clear-fw-options command to cancel the no-break setting.

```
ok  clear-fw-options no-break
fw-options =
```

3 Use the print-fw-options command to make sure that nothing is set.

```
ok  print-fw-options
fw-options =
```

2.3.8 LAN expansion note

When LAN ports have seen added with PCI cards, and each LAN port given its own MAC address, these should be enabled from the ok prompt, as follows:

```
ok  setenv  local-mac-address?  true
```

2.4 Expanding the Server Unit

⚠CAUTION

The following operations should be performed by a service engineer, and not by the user. Otherwise, the product may malfunction.

- Mounting/removal of optional internal units

The following optional items can be added to the PRIMEPOWER200 Pedestal Server:

- CPU modules
- Memory modules
- Hard disk drives
- PCI cards

Systemboard mounting locations are as follows:

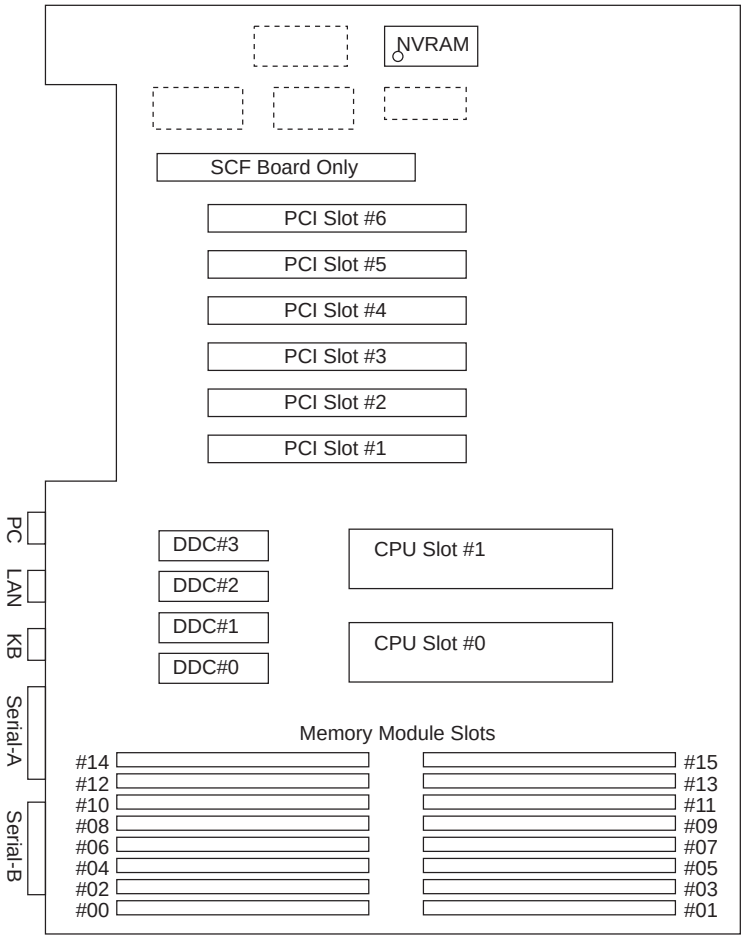


Figure 2.7 PRIMEPOWER200 Pedestal Server Systemboard

2.4.1 Adding CPU modules

A total of two CPU module slots are provided on the PRIMEPOWER200 Pedestal Server Systemboard.

When adding CPU modules the following restrictions apply:

- Only a SPARC64 GP processor can be used.
- To ensure they all operate at the same clock speed, have the same cache size and use the same CPU stepping, the model name must be identical for all CPUs.
- CPU modules must be added according to Table 2.4 .

IMPORTANT

Operation for configurations other than those shown in Table 2.4 cannot be guaranteed.

Table 2.4 Allowed CPU Module Configurations

No. of CPUs	CPU slot #		No. of DDCs	DDCs to be added (incremental)
	#0	#1		
1	O	-	2	DDC #0, DDC #1
2	O	O	4	DDC #2, DDC #3

2.4.2 Adding memory modules

A total of 16 memory module slots are provided on the PRIMEPOWER200 Pedestal Server Systemboard.

When adding memory modules the following restrictions apply.

IMPORTANT

Operation for configuration other than those described below cannot be guaranteed.

- Each sequential group of 4 memory slots (#0-3, #4-7, #8-11, #12-15) must be either left empty or completely filled with 4 identical memory modules.

2.4.3 Adding hard disk drives

Disk drive configurations

Up to eight hot-swappable UltraSCSI disk drives can be added to the PRIMEPOWER200 Pedestal Server. Removing the front cover can access the disk drives shown in the following figure. The base SCSI unit (bays #0 to #3) is connected to the base UltraSCSI bus, and the optional Disk Expansion Unit (bays #0 to #3) should be connected to an UltraSCSI bus card installed in a PCI slot.

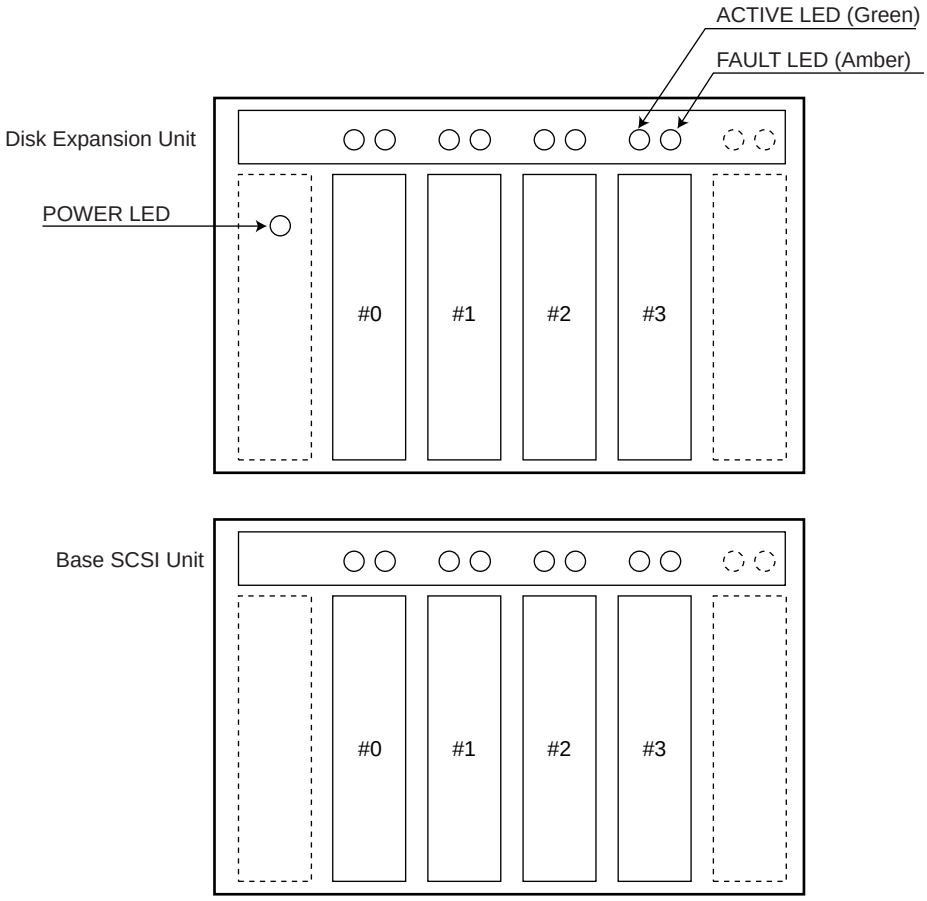


Figure 2.8 PRIMEPOWER200 Disk Drive Configuration

⚠CAUTION

Data Destruction

Set the UltraSCSI and PCI card buses correctly. If these buses are set incorrectly, data may be lost as hot-swapping of these disk drives cannot be performed correctly.

To add a fifth disk drive to the PRIMEPOWER200 Pedestal Server, the optional Disk Expansion Unit must be installed.

The following settings should be made after the Disk Expansion Unit has been installed:

1 From the ok prompt execute the show-scsi command to get the path name of the UltraSCSI card and its PCI slot.

The following example shows an UltraSCSI card installed in PCI slot#6.

```
ok show-scsi
PCI#6 : /pci@16,4000/scsi@5,1
PCI#6 : /pci@16,4000/scsi@5
SCSI#0: /pci@17,4000/scsi@3
ok
```

2 From the ok prompt set led-control-1 to correspond to the PCI slot number with the setenv command.

The following example shows an UltraSCSI card connected to SCSI connector #1 of the UltraSCSI card in PCI slot#6.

```
ok setenv led-control-1 /pci@17,4000/scsi@5
```

Hot-swapping hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the PRIMEPOWER200 Pedestal Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE and FAULT LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

2.4.4 Adding PCI cards

There are three types of PCI card: a PCI card designed to operate in 3.3V slots, a PCI card designed to operate in 5V slots, and a PCI (universal) card design to operate in both 3.3V and 5V slots. Though most PCI cards operate at a 33MHz clock, some cards operate at a 66MHz clock.

Refer to Table 2.5 and Figure 2.9 below for details of the PCI slot positions when installing PCI cards.

Table 2.5 PCI Slot Specifications

PCI Slot number	PCI Bus	Slot / Card Width (bits)	PCI Clock Rate (MHz)	Card Input Voltage	long / short
6	D	64 / 32, 64	33	5V or Universal	long
5	D	64 / 32, 64	33	5V or Universal	long
4	D	64 / 32, 64	33	5V or Universal	long
3	C	64 / 32, 64	33	5V or Universal	long
2	B	64 / 32, 64	33 / 66	3.3V or Universal	long
1	A	64 / 32, 64	33 / 66	3.3V or Universal	long

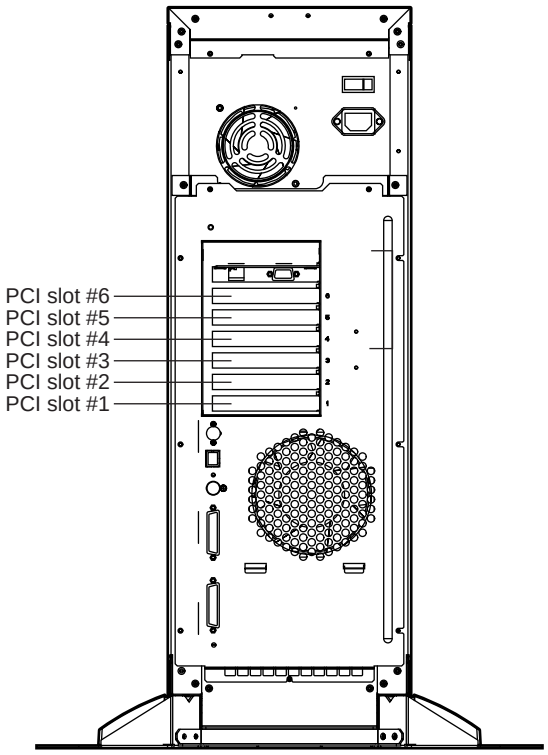


Figure 2.9 Rear of PRIMEPOWER200 Pedestal Server showing position of PCI slots

3

PRIMEPOWER200 Rackmount (4U) Server

This chapter gives an overview of the PRIMEPOWER200 Rackmount (4U) Server, names and functions of parts, preparations for use, and how to expand the server unit.

CONTENTS

3.1 Overview 26
3.2 Names and Functions of Parts 27
3.3 Preparations for Use 31
3.4 Expanding the Server Unit 41

3.1 Overview

The following describes the key features and appearance of the PRIMEPOWER200 Rackmount (4U) Server.

Key Features

- The server unit can be configured with up to two CPUs.
- Up to 16 gigabytes of memory can be mounted.
- Six PCI slots (2 x 33/66MHz + 4 x 33MHz) are provided.
- Up to two UltraSCSI disk drives can be built in.
- One tape unit (DDS4 DAT, 8mm) can be installed.
- A CD-ROM drive is provided as standard.
- One 100Base-TX port, two serial ports (RS-232C) and one keyboard/mouse port are provided as standard.
- Redundant fan and N+1 redundant power supply configurations are supported.

Appearance

The following illustration shows the appearance of the PRIMEPOWER200 Rackmount (4U) Server.

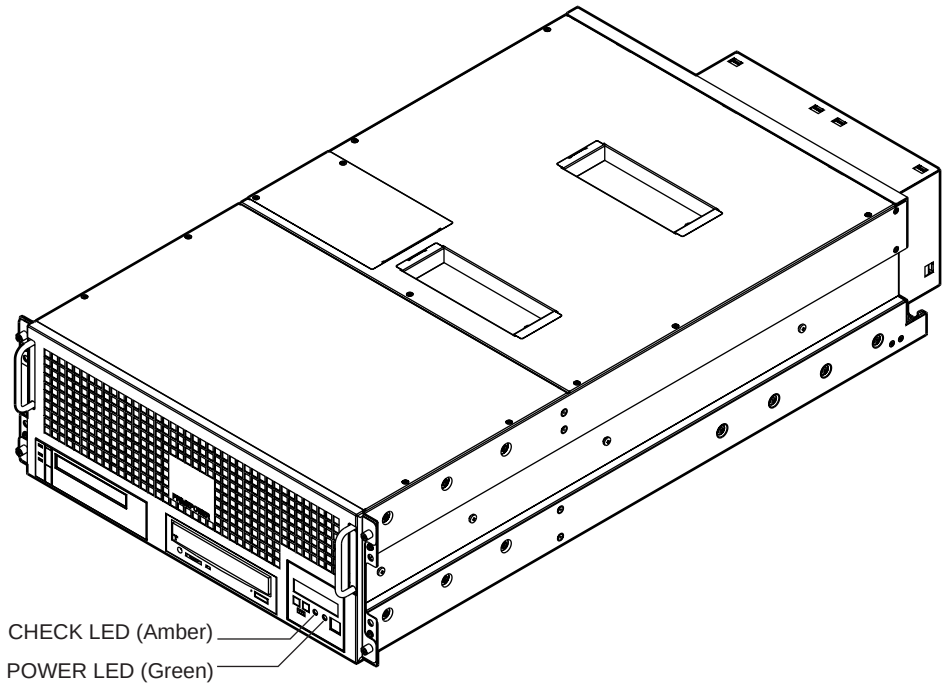


Figure 3.1 PRIMEPOWER200 Rackmount (4U) Server

3.2 Names and Functions of Parts

This section describes the names and functions of parts on the front, control panel and rear of the PRIMEPOWER200 Rackmount (4U) Server.

3.2.1 Front side

The names and functions of parts on the front of the PRIMEPOWER200 Rackmount (4U) Server are as follows.

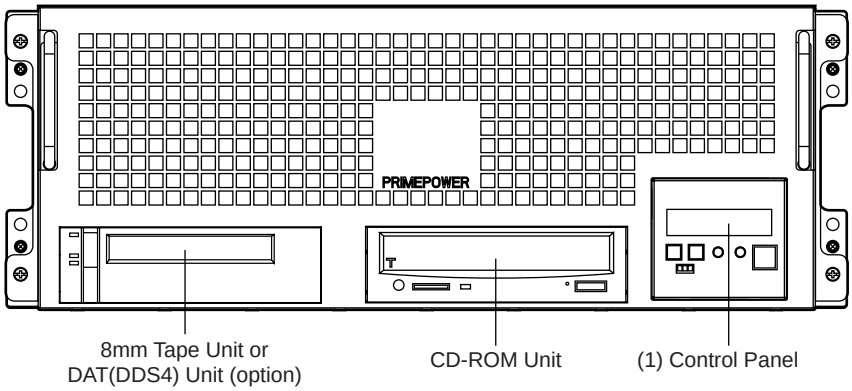


Figure 3.2 Front of PRIMEPOWER200 Rackmount (4U) Server

(1) Control panel

Contains various switches and indicator LEDs. See "3.2.2 Control Panel" for details.

3.2.2 Control panel

The PRIMEPOWER200 Rackmount (4U) Server is provided with the control panel shown in Figure 3.3 .

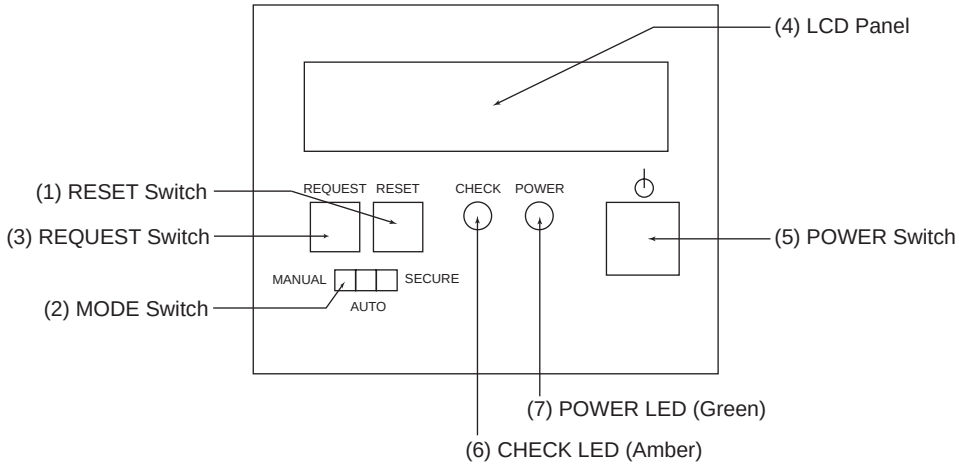


Figure 3.3 Control Panel

Note: To prevent erroneous operation, all push-button switches on the control panel are designed not to function unless held down for at least 0.3 seconds.

(1) RESET switch (push button)

⚠CAUTION

Data Destruction

Pressing the RESET switch while the system is running may cause data to be lost.

The RESET switch is used to reset the system to its initial state and is enabled or disabled by the MODE switch, as described in "(2) MODE switch".

(2) MODE switch (3-position slider)

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

The MODE switch has three settings and is used to specify the run mode at power on or system reboot, and to whether the POWER, RESET and REQUEST switches are "enabled" or "disabled".

Table 3.1 MODE Switch Settings

MODE switch	POWER switch	RESET switch	REQUEST switch	Operation mode
MANUAL	Enabled	Enabled	Enabled	The bootup sequence stops at an ok prompt after initial diagnostics are completed. Use this mode to enter commands and make settings from the ok prompt when performing maintenance on the server unit.
AUTO	Enabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed.
SECURE	Disabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed. The TTY terminal "break" and keyboard "STOP+A" commands are disabled while Solaris is operating.

(3) REQUEST switch (push button)

⚠CAUTION

Data Destruction

Pressing the REQUEST switch while the system is running may cause data to be lost.

The REQUEST switch is for outputting a memory dump when an error has occurred in the system. Only service engineers should operate the REQUEST switch.

(4) LCD panel

The 16-digit x 2-row LCD panel displays the status of initial diagnostics performed when the power is turned on.

It also displays error messages when a hardware error has been detected. For details on error messages that may be displayed, see "13 Troubleshooting".

A LCD panel error message is cleared by one of the following:

- When the problem has been fixed
- When the power is next turned on
- When the main AC power is cut off.

Some displayed error messages may be cleared when the RESET switch is pressed.

(5) POWER switch (push button)

The POWER switch instructs the system to turn the power on and off.

Power on and off of expansion units (such as the Expansion File Unit Type-2) is interlocked with the powering on and off of the PRIMEPOWER200 Rackmount (4U) Server.

Operation of the POWER switch varies according to the MODE switch and scftool (software contained in the "Enhanced Support Facility") settings. For details, see "(2) MODE switch" and the "Enhanced Support Facility User's Guide."

(6) CHECK LED

IMPORTANT

When the PRIMEPOWER200 Rackmount (4U) Server detects an error in the power line or abnormal temperatures, the CHECK LED blinks and the power is automatically turned off to prevent unit damage and ensure safety.

The CHECK LED blinks or lights up when the PRIMEPOWER200 Rackmount (4U) Server detects an error.

When the power is turned on, the CHECK LED lights up and then goes out. This is not an error. If the CHECK LED stays lit and does not go out at power on, this indicates an error.

When an error occurs, note down the details displayed on the LCD panel, and contact a service engineer.

(7) POWER LED

The POWER LED indicates the power state of the system. This LED lights up when the power is on, and goes out when the power is turned off.

3.2.3 Rear side

The names and functions of parts on the rear of the PRIMEPOWER200 Rackmount (4U) Server are as follows.

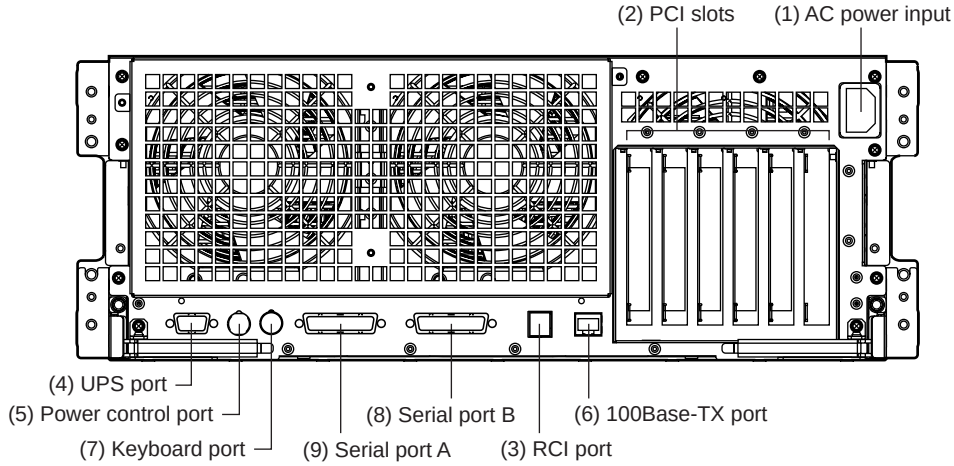


Figure 3.4 Rear of PRIMEPOWER200 Rackmount (4U) Server

(1) AC power input

Connect the power cable to this point.

(2) PCI slots

- PCI slots conform to the PCI local bus specification (Rev. 2.1).
- 64-bit bus, 33MHz (5.0 V) and 33/66MHz (3.3V) are supported.
- Both short cards (17.46 cm, 6.87 in.) and long cards (31.19 cm, 12.3 in.) are supported.

(3) RCI port (label : RCI)

RJ11 connector for connecting the RCI cable and terminator (provided with server unit)

(4) UPS port (label : UPS)

Dsub-9 pin for connecting the signal cable of an uninterruptible power supply

(5) Power control port (label : PC)

8-pin DIN for power control

(6) 100Base-TX port (label : LAN)

RJ45 connector automatically recognizes 10Mbps/100Mbps

(7) Keyboard port (label : KB)

8-pin DIN port for connecting the keyboard cable

(8), (9) Serial ports (label : SERIAL A/B)

Dsub-25 pin ports for connecting a console terminal when performing maintenance on the server unit using the RS-232C interface

3.3 Preparations for Use

This section describes the following:

- Installation notes and specifications
- Connecting the console
- Turning power on and off
- Installing the Enhanced Support Facility package
- Enabling/disabling the break signal
- LAN expansion note

3.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the PRIMEPOWER200 Rackmount (4U) Server may be damaged. Be sure to follow these notes.

Rack installation notes

The following instructions are intended to provide product safety requirements to be addressed when the end-use product manufacturer installs this product in their equipment.

- As the PRIMEPOWER200 Rackmount (4U) Server is installed in a closed or multi-unit rack assembly, the ambient operating temperature inside of the rack environment may be greater than the room temperature. So, consideration should be given to installing the PRIMEPOWER200 Rackmount (4U) Server in an environment compatible with the manufacturer's maximum rated ambient temperature.
  - Consideration for adjustment of air conditions like air circulation should be given to prevent the internal rack ambient temperature from exceeding the maximum operating temperature of this unit.
  - Maximum internal operating temperature of this unit: 35 deg. C (95 deg. F)
- Installation of the PRIMEPOWER200 Rackmount (4U) Server should be such that the amount of air flow required for safe operation of the PRIMEPOWER200 Rackmount (4U) Server is not compromised.
  - The PRIMEPOWER200 Rackmount (4U) Server has ventilation openings at the front and rear faces of the unit.
  - To prevent overheating, do not cover or close these ventilation openings.
- Mounting of the PRIMEPOWER200 Rackmount (4U) Server in the rack should be such that a hazardous condition does not result from uneven mechanical loading. To maintain the stability of the entire rack, please fix the rack to the wall or floor by suitable means.

  - Be careful of injuries during installation of the PRIMEPOWER200 Rackmount (4U) Server into the rack.
  - Do not install the PRIMEPOWER200 Rackmount (4U) Server into a rack if the server unit may make the entire rack unstable.
  - Maximum configured weight of this unit: 50 kg (110.38 lb.)

- If the PRIMEPOWER200 Rackmount (4U) Server is supplied with power from a power strip or service outlet of other units, it may overload the power supply cord or the power strip of other units.
  - Confirm that the current rating of the power strip or service outlet exceeds the combined ratings of all equipment it is supplying.
  - Electrical ratings of this unit: 100 to 240VAC, 6.1A to 2.6A, 50/60Hz, single-phase
- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to non-direct-to-mains connections (e.g. via power strips, etc.).

⚠CAUTION

Connect the ground before connecting any of the power supply lines. If all of the power cables are connected to a single power strip, high leakage current exceeding the stipulated value may leak through to the earth lead of the power strip.

If the power strip is not directly connected to the main distribution panel, use a power strip with an industrial plug.

General installation notes

- Do not block the ventilation holes.
- Do not install the PRIMEPOWER200 Rackmount (4U) Server where it will be exposed to sunlight or sources of heat.
- Do not install the PRIMEPOWER200 Rackmount (4U) Server in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the PRIMEPOWER200 Rackmount (4U) Server isolated from vibration. Install the PRIMEPOWER200 Rackmount (4U) Server on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the PRIMEPOWER200 Rackmount (4U) Server may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the PRIMEPOWER200 Rackmount (4U) Server. Do not use the top of the PRIMEPOWER200 Rackmount (4U) Server as a workspace.
- To prevent condensation in the PRIMEPOWER200 Rackmount (4U) Server, do not raise the ambient room temperature rapidly in winter.

  Use the PRIMEPOWER200 Rackmount (4U) Server only after it has warmed up sufficiently.
- Do not install the PRIMEPOWER200 Rackmount (4U) Server near EM noise generating devices such as photocopiers, air conditioners, or welders.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the PRIMEPOWER200 Rackmount (4U) Server to malfunction.
- When moving the PRIMEPOWER200 Rackmount (4U) Server, do not pull on the front cover. Otherwise, the Server may be damaged.

3.3.2 Installation specifications

Table 3.2 and Table 3.3 show the installation specifications for the PRIMEPOWER200 Rackmount (4U) Server.

Table 3.2 Installation Specifications of the PRIMEPOWER200 Rackmount (4U) Server (1/2)

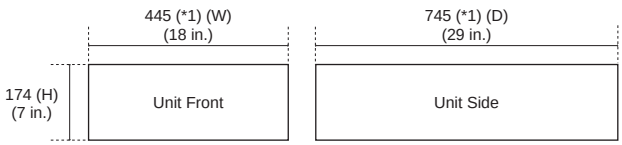
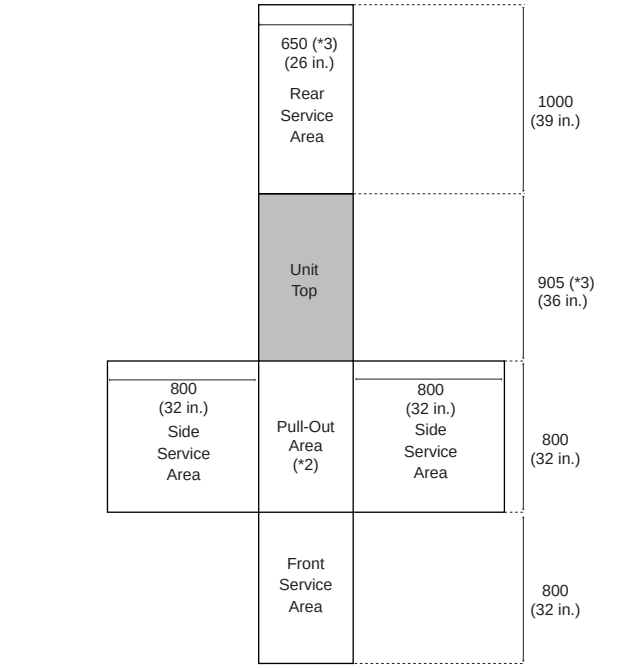
Item		Specification	
Weight		50 kg (110.38 lb.) (max.) (*1)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100 ~ 120V (±10%)	Single phase AC200 ~ 240V (±10%)
Max. Current		6.1 A (100V)	2.6 A (240V)
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*2)	
	Non-Operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-Operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-Operating	0.4 G	
Noise		50 db(A) (*3)	
Form Factor		Rackmount (4U)	

*1: Include Rack Rail weight.

*2: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*3: The indicated noise is the mean value of measurements obtained when the server unit is installed in an 1800mm (71-inch) rack server in a low-noise anechoic chamber. The actual noise measured at the installation site may be greater than the indicated value due to background noise and echoes.

Table 3.3 Installation Specifications of the PRIMEPOWER200 Rackmount (4U) Server (2/2)

Item	Specification
Unit Dimensions (units : mm)	
Service Areas (units : mm)	

*1: Not including any projections.

*2: Keep the pull-out area clear so that devices inside the PRIMEPOWER200 Rackmount (4U) Server can be pulled out from the rack cabinet when performing maintenance.

*3: When a GP7B7RK3x/RK4x rack cabinet is used

3.3.3 Connecting the console

A device such as a personal computer must be connected to the serial port to act as the console for a PRIMEPOWER200 Rackmount (4U) Server to which a display or keyboard is not connected. Pay attention to the following when connecting the console to the serial port on the PRIMEPOWER200 Rackmount (4U) Server.

Connect the serial cable:

Connect to serial A port.

Communication settings on the terminal:

Set to 8 bits, 1 stop bit, parity OFF, and 9600 baud.

3.3.4 Turning the power on

The following describes how to turn the power on.

⚠CAUTION

Data Destruction

Do not turn the console terminal (device connected to the serial port) on after turning the PRIMEPOWER Server on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

- If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.
- When the PRIMEPOWER Server is turned on, a self-diagnostics routine automatically verifies whether or not hardware errors are occurring. If this routine detects any hardware errors, system power is automatically turned off and on again (if the MODE switch on the control panel is set to AUTO or SECURE). This power off/on retry sequence is performed twice. In both retries, the routine checks for errors. If an error occurs in both cases, the routine judges that the system cannot be booted up and stops the system bootup sequence.

Procedure

1 Turn the AC main line power on.

2 Turn the power switches of the console terminal and peripheral devices on.

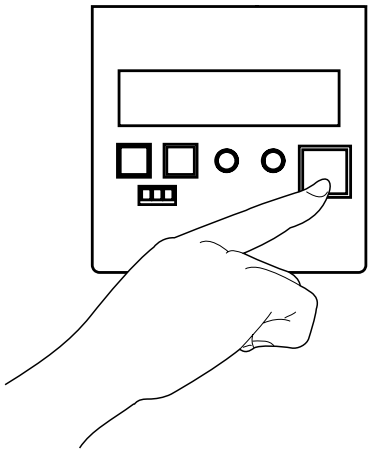


Figure 3.5 Turning the power on

3 Press the POWER switch on the control panel of the PRIMEPOWER200 Rackmount (4U) Server.
The POWER LEDs of the PRIMEPOWER Server and any peripheral devices connected via the RCI port should now light up.

Note: Operation of the POWER switch is disabled when the MODE switch is set to SECURE.
A keyboard power-on function is not supported.

3.3.5 Turning the power off

The following describes how to turn the power off.

⚠CAUTION

Data Destruction

Before turning the power off, check the answer to each of the following points is "No", or data may be lost:

- Are there any currently executing programs?
- Are there any current users?
- Are floppy disks or tape cartridges still inserted in their drives?

Backup files as necessary before turning the power off.

Also, do not turn off the console while the PRIMEPOWER Server is turned on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.

Procedure

1. Press the POWER switch on the control panel of the PRIMEPOWER200 Rackmount (4U) Server.
2. Press the POWER switch again within five seconds (scftool default interval).

   This starts the system shutdown sequence. The power turns off after the system shuts down.

   For details on scftool, refer to the "User's Guide" included with the "Enhanced Support Facility."

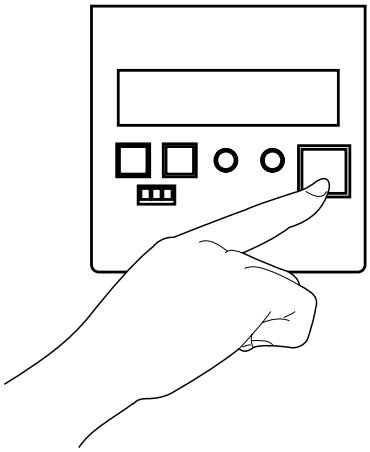


Figure 3.6 Turning the power off

3 Turn the power switches of peripheral devices off after the PRIMEPOWER200 Rackmount (4U) Server power has turned off.

3.3.6 Installing the Enhanced Support Facility package

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

With the PRIMEPOWER servers, be sure to install each of the programs provided with the "Enhanced Support Facility" to ensure the high reliability functions of the service processor. For details, refer to the "User’s Guide" included with the "Enhanced Support Facility."

3.3.7 How to enable/disable the break signal

⚠CAUTION

Data Destruction

If improper commands are used at the ok prompt, data may be lost. If you need to use any command except those shown in this manual, you should fully understand the function and usage of the command before using it.

Data is sometimes lost as the bootup sequence shifts to display of the ok prompt during system operation in response to a break signal from the console terminal connected to the serial port or the STOP+A command from the keyboard.

To prevent this kind of response to a break signal arriving from the serial port or the STOP+A command from the keyboard, make the following settings using the set-fw-options command shown below from the ok prompt and then set the MODE switch on the control panel to the SECURE mode.

How to disable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting values.
The factory default is that nothing is set.

```
ok  print-fw-options
fw-options =
```

2 Use the set-fw-options command to set the value (no-break) for disabling the break signal and STOP command.

```
ok  set-fw-options no-break
fw-options = no-break
```

3 Use the print-fw-options command to make sure that no-break is correctly set.

```
ok  print-fw-options
fw-options = no-break
```

How to enable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting values. If the no-break shown below is not displayed, the break signal and STOP+A command are already enabled.

```
ok  print-fw-options
fw-options = no-break
```

2 Use the clear-fw-options command to cancel the no-break setting.

```
ok  clear-fw-options no-break
fw-options =
```

3 Use the print-fw-options command to make sure that nothing is set.

```
ok  print-fw-options
fw-options =
```

3.3.8 LAN expansion note

When LAN ports have seen added with PCI cards, and each LAN port given its own MAC address, these should be enabled from the ok prompt, as follows:

```
ok  setenv  local-mac-address?  true
```

3.4 Expanding the Server Unit

⚠CAUTION

The following operations should be performed by a service engineer, and not by the user. Otherwise, the product may malfunction.

- Mounting/removal of optional internal units

The following optional items can be added to the PRIMEPOWER200 Rackmount (4U) Server.

- Power supply units
- CPU modules
- Memory modules
- Hard disk drives
- PCI cards

Systemboard mounting locations are as follows:

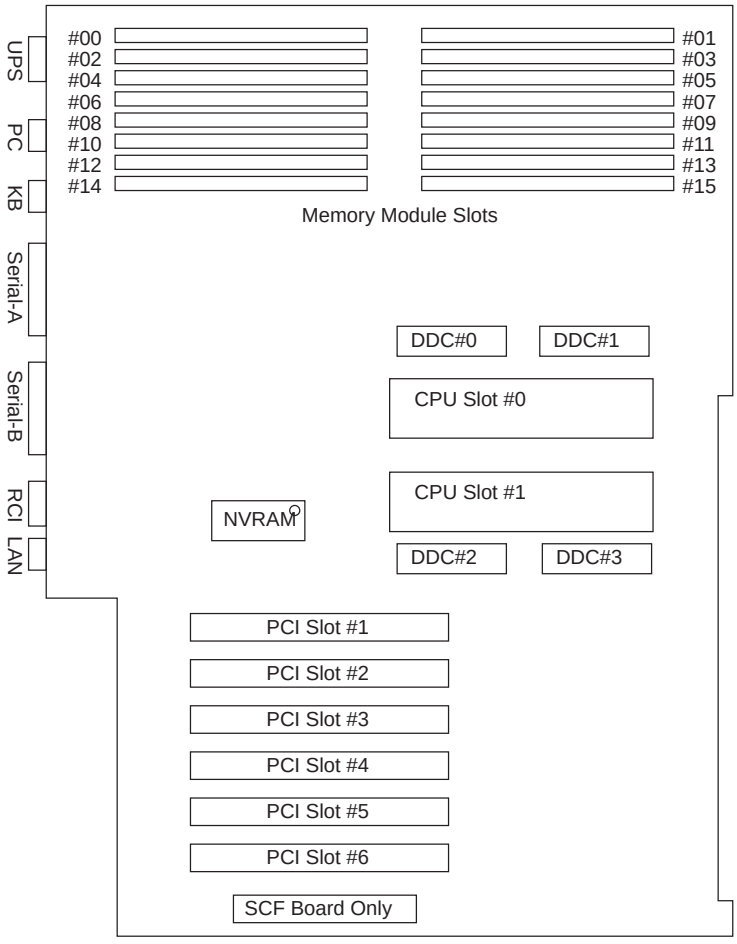


Figure 3.7 PRIMEPOWER200 Rackmount (4U) Systemboard

3.4.1 Adding power supply units

IMPORTANT

Adding an optional redundant power supply unit allows hot-swapping of the power supply units.

⚠CAUTION

Unit Damage

Data may be lost if hot-swapping of power supply units is not performed correctly. Contact the service engineer if a power supply unit must be hot-swapped.

Power supply units (FEP) installed on the PRIMEPOWER200 Rackmount (4U) Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping. For details on how to swap power supply units, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

3.4.2 Adding CPU modules

A total of two CPU module slots are provided on the PRIMEPOWER200 Rackmount (4U) Systemboard.

When adding CPU modules the following restrictions apply:

- Only SPARC64 GP processors can be used.
- To ensure they all operate at the same clock speed, have the same cache size and use the same CPU stepping, the model name must be identical for all CPUs.
- CPU modules must be added according to Table 3.4 .

IMPORTANT

Operation for configurations other than those shown in Table 3.4 cannot be guaranteed.

Table 3.4 Allowed CPU Module Configurations

No. of CPUs	CPU slot #		No. of DDCs	DDCs to be added (incremental)
	#0	#1		
1	O	-	2	DDC #0, DDC #1
2	O	O	4	DDC #2, DDC #3

3.4.3 Adding memory modules

A total of 16 memory module slots are provided on the PRIMEPOWER200 Rackmount (4U) Systemboard.

When adding memory modules the following restrictions apply.

IMPORTANT

Operation for configuration other than those described below cannot be guaranteed.

- Each sequential group of 4 memory slots (#0-3, #4-7, #8-11, #12-15) must be either left empty or completely filled with 4 identical memory modules.

3.4.4 Adding hard disk drives

Disk drive configuration

Up to two hot-swappable UltraSCSI disk drives can be added to the PRIMEPOWER200 Rackmount (4U) Server. Each of the disk drive bays is provided with an ACTIVE LED and a FAULT LED.

The ACTIVE LED lights up (green) when a hard disk drive is operating (reading or writing). The FAULT LED lights up according to the swapping procedure when hot-swapping a hard disk drive.

Hot-swapping hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the PRIMEPOWER200 Rackmount (4U) Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE and FAULT LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

3.4.5 Adding PCI cards

There are three types of PCI card: a PCI card designed to operate in 3.3V slots, a PCI card designed to operate in 5V slots, and a PCI (universal) card design to operate in both 3.3V and 5V slots. Though most PCI cards operate at a 33MHz clock, some cards operate at a 66MHz clock.

Refer to Table 3.5 and Figure 3.8 below for details of the PCI slot positions when installing PCI cards.

Table 3.5 PCI Slot Specifications

PCI Slot number	PCI Bus	Slot / Card Width (bits)	PCI Clock Rate (MHz)	Card Input Voltage	long / short
6	D	64 / 32, 64	33	5V or Universal	long
5	D	64 / 32, 64	33	5V or Universal	long
4	D	64 / 32, 64	33	5V or Universal	long
3	C	64 / 32, 64	33	5V or Universal	short
2	B	64 / 32, 64	33 / 66	3.3V or Universal	short
1	A	64 / 32, 64	33 / 66	3.3V or Universal	short

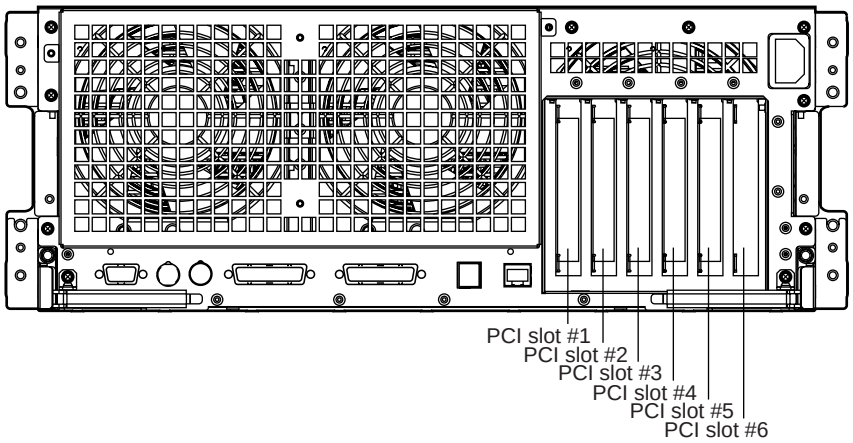


Figure 3.8 Rear View of PRIMEPOWER200 Rackmount (4U) showing position of PCI slots

4

PRIMEPOWER400 Pedestal Server

This chapter gives an overview of the PRIMEPOWER400 Pedestal Server, names and functions of parts, preparations for use, and how to expand the server unit.

CONTENTS

4.1 Overview 46
4.2 Names and Functions of Parts 47
4.3 Preparations for Use 52
4.4 Expanding the Server Unit 61

4.1 Overview

The following describes the key features and appearance of the PRIMEPOWER400 Pedestal Server.

Key Features

- The server unit can be configured with up to four CPUs.
- Up to 16 gigabytes of memory can be mounted.
- Ten PCI slots (3 x 33/66MHz + 7 x 33MHz) are provided.
- Up to six UltraSCSI disk drives can be built in.
- One tape unit (DDS4 DAT, 8mm or DLT) can be installed.
- A CD-ROM drive is provided as standard.
- One 100Base-TX port, two serial ports (RS-232C) and one keyboard/mouse port are provided as standard.
- Redundant fan and N+1 redundant power supply configurations are supported.

Appearance

The following illustrations show the appearance of the PRIMEPOWER400 Pedestal Server.

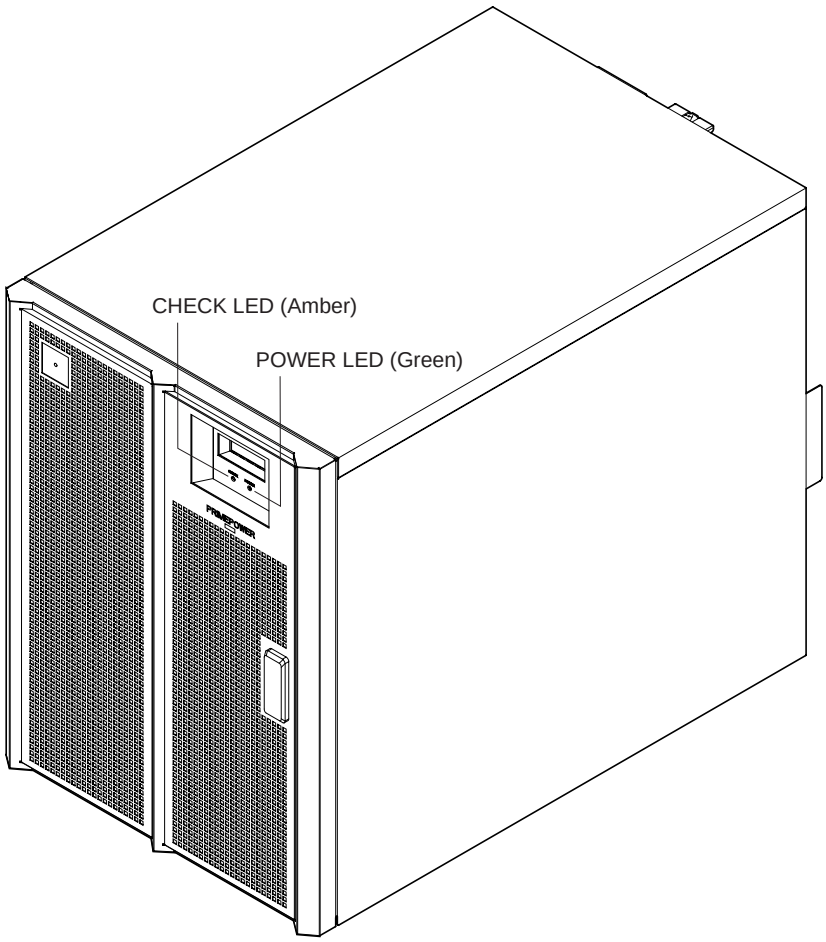


Figure 4.1 PRIMEPOWER400 Pedestal Server

4.2 Names and Functions of Parts

This section describes the names and functions of parts on the front, control panel and rear of the PRIMEPOWER400 Pedestal Server.

4.2.1 Front side

The names and functions of parts on the front of the PRIMEPOWER400 Pedestal Server are as follows.

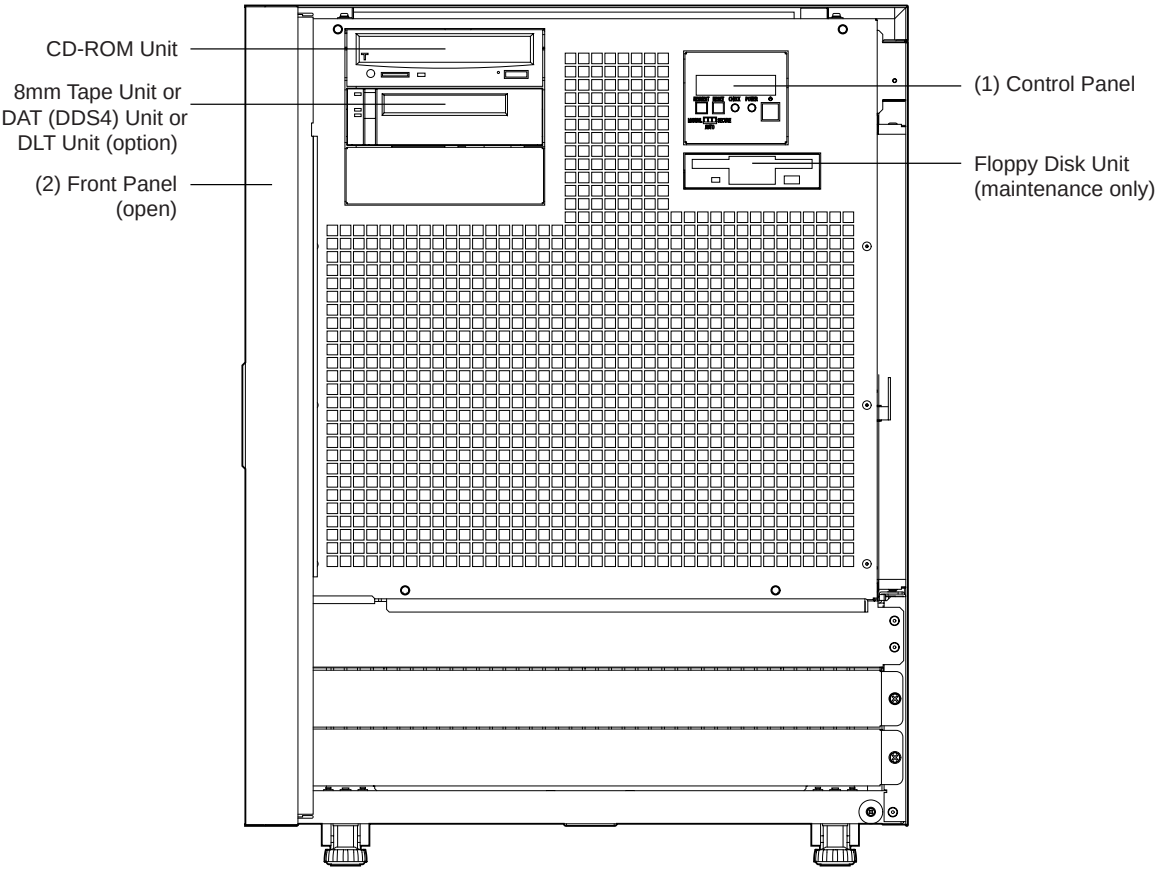


Figure 4.2 Front of PRIMEPOWER400 Pedestal Server

(1) Control panel

Contains various switches and indicator LEDs. See "4.2.2 Control Panel" for details.

(2) Front cover

The panel cover can be opened to its right after being unlocked.

The LCD panel and the POWER and CHECK LEDs can be checked with the cover closed.

4.2.2 Control panel

The PRIMEPOWER400 Pedestal Server is provided with the control panel shown in Figure 4.3 .

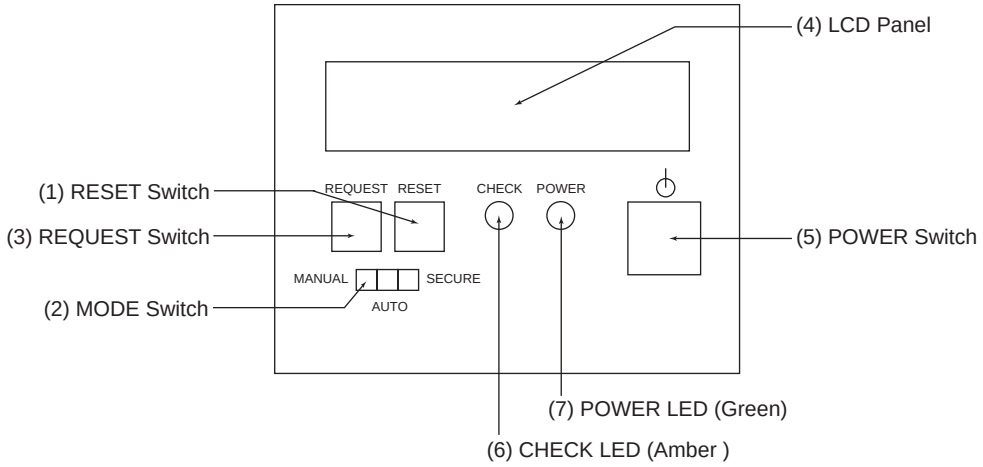


Figure 4.3 Control Panel

Note: To prevent erroneous operation, all push-button switches on the control panel are designed not to function unless held down for at least 0.3 seconds.

(1) RESET switch (push button)

⚠CAUTION

Data Destruction

Pressing the RESET switch while the system is running may cause data to be lost.

The RESET switch is used to reset the system to its initial state and is enabled or disabled by the MODE switch described in "(2) MODE switch".

(2) MODE switch (3-position slider)

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

The MODE switch has three settings and is used to specify the run mode at power on or a system-reboot, and to whether the POWER, RESET and REQUEST switches are "enabled" or "disabled".

Table 4.1 MODE Switch Settings

MODE switch	POWER switch	RESET switch	REQUEST switch	Operation mode
MANUAL	Enabled	Enabled	Enabled	The bootup sequence stops at an ok prompt after initial diagnostics are completed. Use this mode to enter commands and make settings from the ok prompt when performing maintenance on the server unit.
AUTO	Enabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed.
SECURE	Disabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed. The TTY terminal "break" and keyboard "STOP+A" commands are disabled while Solaris is operating.

(3) REQUEST switch (push button)

⚠CAUTION

Data Destruction

Pressing the REQUEST switch while the system is running may cause data to be lost.

The REQUEST switch is for outputting a memory dump when an error has occurred in the system. Only service engineers should operate the REQUEST switch.

(4) LCD panel

The 16-digit x 2-row LCD panel displays the status of initial diagnostics performed when the power is turned on.

It also displays error messages when a hardware error has been detected. For details on error messages that maybe displayed, see "13 Troubleshooting".

A LCD panel error message is cleared by one of the following:

- When the problem has been fixed
- When the power is next turned on
- When the main AC power is cut off.

Some displayed error messages may be cleared when the RESET switch is pressed.

(5) POWER switch (push button)

The POWER switch instructs the system to return the power on and off.

Power on and off of expansion units (such as the Expansion Disk Cabinet) is interlocked with the powering on and off of the PRIMEPOWER400 Pedestal Server.

Operation of the POWER switch varies according to the MODE switch and scftool (software contained in the "Enhanced Support Facility") settings. For details, see "(2) MODE switch" and the "Enhanced Support Facility User's Guide."

(6) CHECK LED

IMPORTANT

When the PRIMEPOWER400 Pedestal Server detects an error in the power line or abnormal temperatures, the CHECK LED blinks and the power is automatically turned off to prevent unit damage and ensure safety.

The CHECK LED blinks or lights up when the PRIMEPOWER400 Pedestal Server detects an error.

When the power is turned on, the CHECK LED lights up and then goes out. This is not an error. If the CHECK LED stays lit and does not go out at power on, this indicates an error.

When an error occurs, note down the details displayed on the LCD panel, and contact a service engineer.

(7) POWER LED

The POWER LED indicates the power state of the system. This LED lights up when the power is on, and goes out when the power is turned off.

4.2.3 Rear side

The names and functions of parts on the rear of the PRIMEPOWER400 Pedestal Server are as follows.

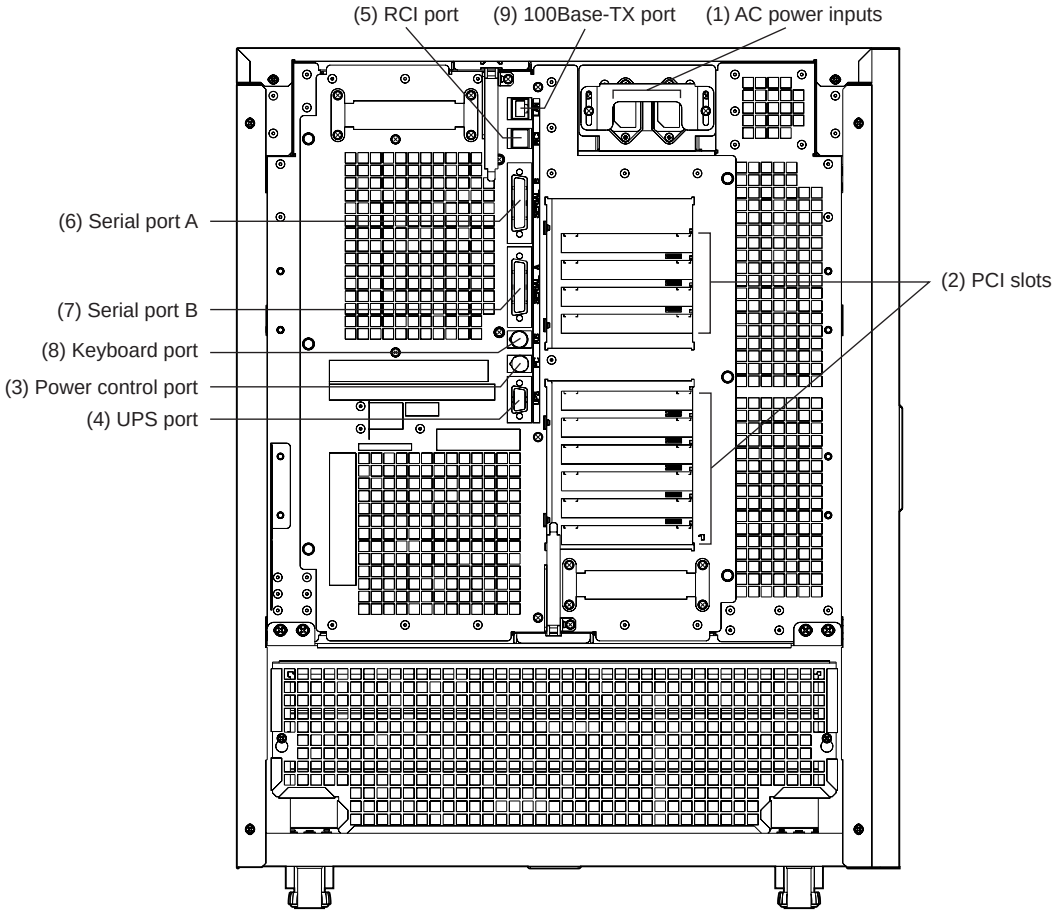


Figure 4.4 Rear of PRIMEPOWER400 Pedestal Server

(1) AC power inputs

Connect the power cables to these points. Both AC power cords must be plugged into the same power grid / circuit.

(2) PCI slots

- PCI slots conform to the PCI local bus specifications (Rev. 2.1).
- 64-bit bus, 33MHz (5.0 V) and 33/66MHz (3.3V) are supported.
- Both short cards (17.46 cm, 6.87 in.) and long cards (31.19 cm, 12.3 in.) are supported.

(3) Power control port (label : PC)

8-pin DIN for power control

(4) UPS port (label : UPS)

Dsub-9 pin for connecting the signal cable of an uninterruptible power supply

(5) RCI port (label : RCI)

RJ11 connector for connecting the RCI cable and terminator (provided with the server unit)

(6), (7) Serial ports (label : SERIAL A/B)

Dsub-25 pin ports for connecting a console terminal when performing maintenance on the server unit using the RS-232C interface

(8) Keyboard port (label : KB)

8-pin DIN port for connecting a keyboard cable

(9) 100Base-TX ports (label : LAN)

RJ45 connector automatically recognizes 10Mbps/100Mbps. (11) RJ45 connector is valid when system expansion mechanisms are installed.

4.3 Preparations for Use

This section describes the following:

- Installation notes and specifications
- Connecting the console
- Turning power on and off
- Installing the Enhanced Support Facility package
- Enabling/disabling the break signal
- LAN expansion note

4.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the PRIMEPOWER400 Pedestal Server may be damaged. Be sure to follow these notes.

- Do not block the ventilation holes.
- Do not install the PRIMEPOWER400 Pedestal Server where it will be exposed to sunlight or sources of heat.
- Do not install the PRIMEPOWER400 Pedestal Server in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the PRIMEPOWER400 Pedestal Server isolated from vibration. Install the PRIMEPOWER400 Pedestal Server on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the PRIMEPOWER400 Pedestal Server may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the PRIMEPOWER400 Pedestal Server. Do not use the top of the PRIMEPOWER400 Pedestal Server as a workspace.

- To prevent condensation in the PRIMEPOWER400 Pedestal Server, do not raise the ambient room temperature rapidly in winter.

  Use the PRIMEPOWER400 Pedestal Server only after it has warmed up sufficiently.
- Do not install the PRIMEPOWER400 Pedestal Server near EM noise generating devices such as photocopiers, air conditioners, or welders.
- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the PRIMEPOWER400 Pedestal Server to malfunction.
- When moving the PRIMEPOWER400 Pedestal Server, do not pull on the front cover. Otherwise, the Server may be damaged.

4.3.2 Installation specifications

Table 4.2 and Table 4.3 show the installation specifications for the PRIMEPOWER400 Pedestal Server.

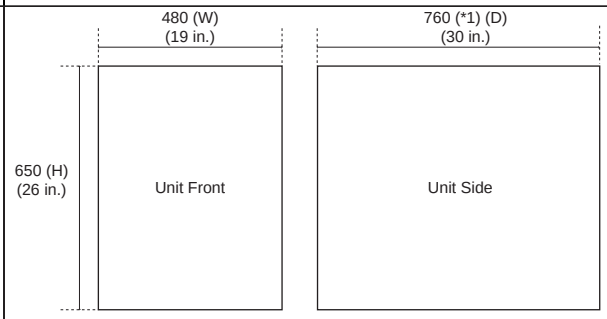
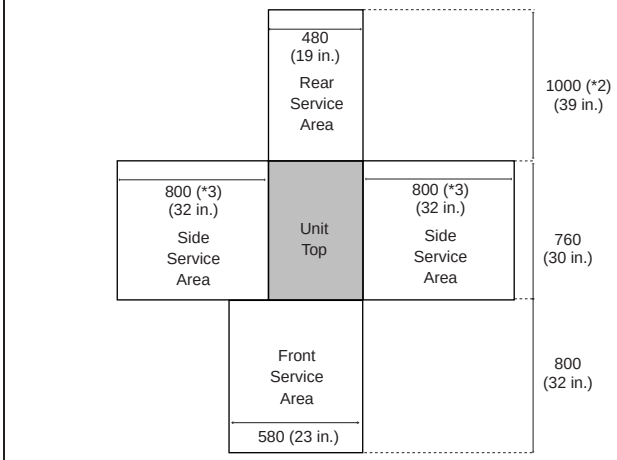
Table 4.2 Installation Specifications of the PRIMEPOWER400 Pedestal Server (1/2)

Item		Specification	
Weight		125 kg (275.94 lb.) (max.)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100V (±10%)	Single phase AC200V (±10%)
Max. Current		12.0 A	6.0 A
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*1)	
	Non-operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-operating	0.4 G	
Noise		47 db(A) (*2)	
Form Factor		Pedestal	

*1: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2: The indicated noise is the mean value of measurements obtained in a low-noise anechoic chamber. The actual noise measured at the installation site may be greater than the indicated value due to background noise and echoes.

Table 4.3 Installation Specifications of the PRIMEPOWER400 Pedestal Server (2/2)

Item	Specification
Unit Dimensions (units : mm)	
Service Areas (units : mm)	

*1: Not including any projections.

*2: If it is possible to move the Server Unit so that 800 mm (32-inch) or more space is available behind the unit when maintenance is performed, then 200mm (8-inch) of space is adequate is normal use. However, if optical cables are used, at least 300mm (12- inch) of space will be needed between the rear of the Unit and the wall.

*3: If it is possible to move the server unit so that the 800mm (32-inch) or more space is available beside the Unit when maintenance is performed, then no space is required in normal use.

4.3.3 Connecting the console

A device such as a personal computer must be connected to the serial port to act as the console for a PRIMEPOWER400 Pedestal Server to which a display or keyboard is not connected. Pay attention to the following when connecting the console to the serial port on the PRIMEPOWER400 Pedestal Server.

Connect the serial cable:

Connect to serial A port.

Communication settings on the terminal:

Set to 8 bits, 1 stop bit, parity OFF, and 9600 baud.

4.3.4 Turning the power on

The following describes how to turn the power on.

⚠CAUTION

Data Destruction

Do not turn the console terminal (device connected to the serial port) on after turning the PRIMEPOWER Server on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

- If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.
- When the PRIMEPOWER Server is turned on, a self-diagnostics routine automatically verifies whether or not hardware errors are occurring. If this routine detects any hardware errors, system power is automatically turned off and on again (if the MODE switch on the control panel is set to AUTO or SECURE). This power off/on retry sequence is performed twice. In both retries, the routine checks for errors. If an error occurs in both cases, the routine judges that the system cannot be booted up and stops the system bootup sequence.

Procedure

1 Turn the AC main line power on.

2 Turn the power switches of the console terminal and peripheral devices on.

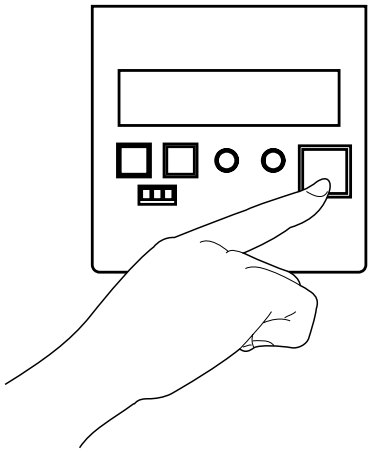


Figure 4.5 Turning the power on

3 Press the POWER switch on the control panel of the PRIMEPOWER400 Pedestal Server.

The POWER LEDs of the PRIMEPOWER Server and any peripheral devices connected via the RCI port should now light up.

Note: Operation of the POWER switch is disabled when the MODE switch is set to SECURE.

A keyboard power-on function is not supported.

4.3.5 Turning the power off

The following describes how to turn the power off.

⚠CAUTION

Data Destruction

Before turning the power off, check the answer to each of the following points is "No", or data may be lost:

- Are there any currently executing programs?
- Are there any current users?
- Are floppy disks or tape cartridges still inserted in their drives?

Backup files as necessary before turning the power off.

Also, do not turn off the console while the PRIMEPOWER Server is turned on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.

Procedure

1. Press the POWER switch on the control panel of the PRIMEPOWER400 Pedestal Server.
2. Press the POWER switch again within five seconds (scftool default interval).
   This starts the system shutdown sequence. The power turns off after the system shuts down.
   For details on scftool, refer to the "User’s Guide" included with the "Enhanced Support Facility."

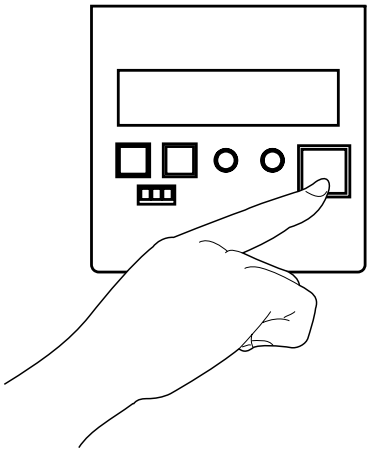


Figure 4.6 Turning the power off

3 Turn the power switches of peripheral devices off after the PRIMEPOWER400 Pedestal Server power has turned off.

4.3.6 Installing the Enhanced Support Facility package

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

With the PRIMEPOWER servers, be sure to install all of the programs provided with the "Enhanced Support Facility" to ensure the high reliability functions or the service processor. For details, refer to the "User’s Guide" included with the "Enhanced Support Facility."

4.3.7 How to enable/disable the break signal

⚠CAUTION

Data Destruction

If improper commands are used at the ok prompt, data may be lost. If you need to use any command except those shown in this manual, you should fully understand the function and usage of the command before using it.

Data is sometimes lost as the bootup sequence shifts to display of the ok prompt during system operation in response to a break signal from the console terminal connected to the serial port or the STOP+A command from the keyboard.

To prevent this kind of response to a break signal arriving from the serial port or the STOP+A command from the keyboard, make the following settings using the set-fw-options command shown below with the ok prompt displayed on screen, and then set the MODE switch on the control panel to the SECURE mode.

How to disable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting.
The factory default is that nothing is set.

```
ok  print-fw-options
fw-options =
```

2 Use the set-fw-options command to set the value (no-break) for disabling the break signal and STOP command.

```
ok  set-fw-options no-break
fw-options = no-break
```

3 Use the print-fw-options command to make sure that no-break is correctly set.

```
ok  print-fw-options
fw-options = no-break
```

How to enable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting values. If the no-break shown below is not displayed, the break signal and STOP+A command are already enabled.

```
ok  print-fw-options
fw-options = no-break
```

2 Use the clear-fw-options command to cancel the no-break setting.

```
ok  clear-fw-options no-break
fw-options =
```

3 Use the print-fw-options command to make sure that nothing is set.

```
ok  print-fw-options
fw-options =
```

4.3.8 LAN expansion note

When LAN ports have seen added with PCI cards, and each LAN port given its own MAC address, these should be enabled from the ok prompt, as follows:

```
ok  setenv  local-mac-address?  true
```

4.4 Expanding the Server Unit

⚠CAUTION

The following operations should be performed by a service engineer, and not by the user. Otherwise, the product may malfunction.

- Mounting/removal of optional internal units

The following optional items can be added to the PRIMEPOWER400 Pedestal Server:

- Power supply units
- CPU modules
- Memory modules
- Hard disk drives
- PCI cards

Systemboard mounting locations are as follows:

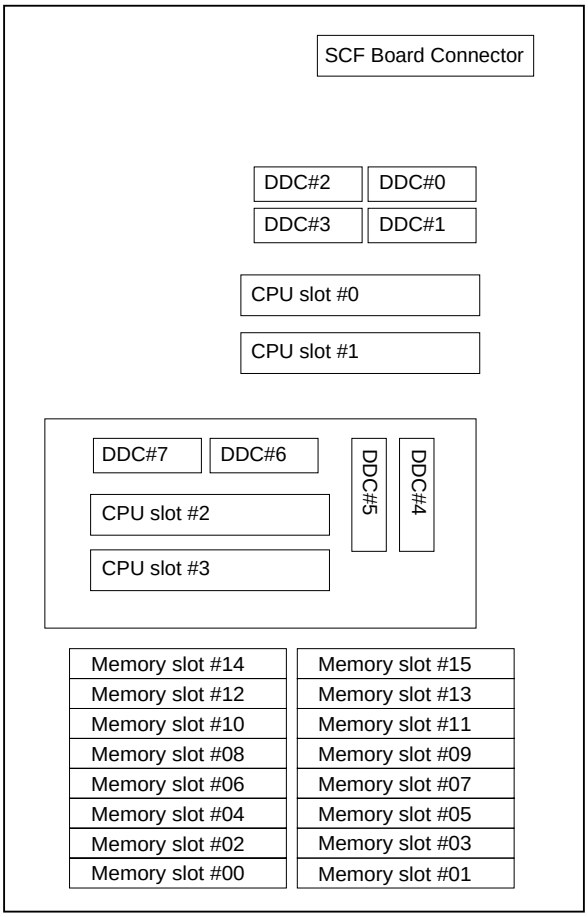


Figure 4.7 PRIMEPOWER400 Pedestal Server Systemboard

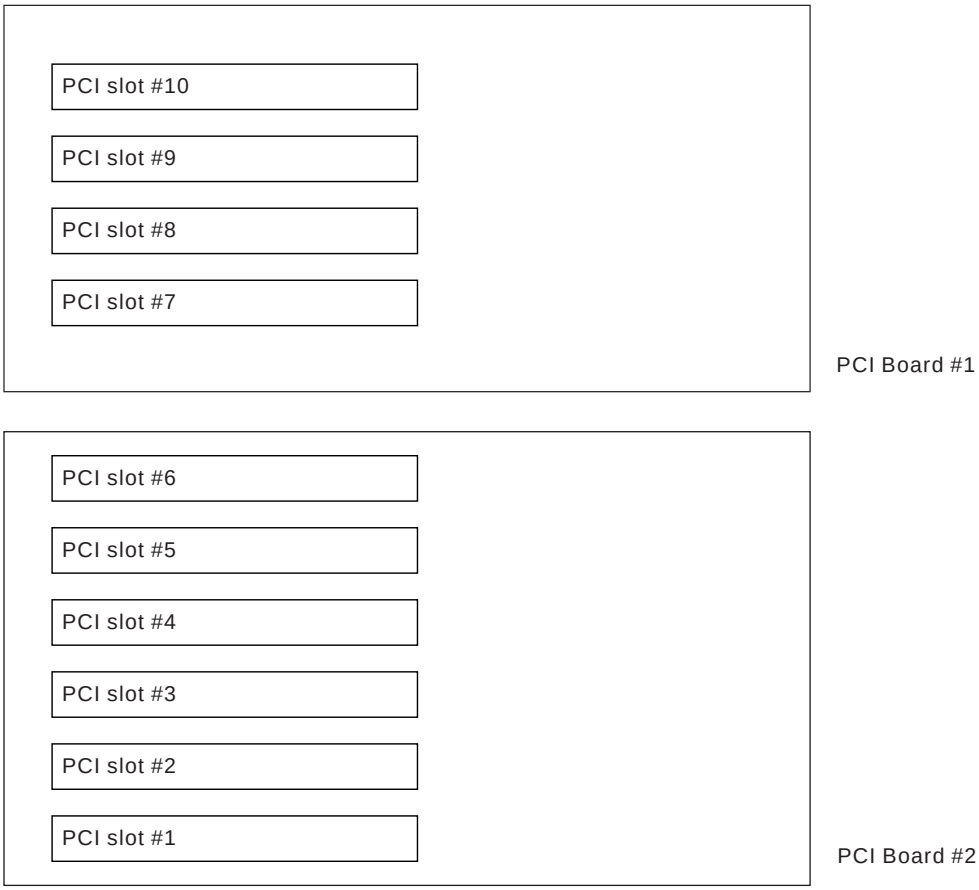


Figure 4.8 PRIMEPOWER400 Pedestal Server PCI boards

4.4.1 Adding power supply units

IMPORTANT

Adding an optional redundant power supply unit allows hot-swapping of the power supply units.

⚠CAUTION

Unit Damage

Power supply units may be damaged if hot-swapping of the power supply units is not performed correctly. Contact the service engineer if a power supply unit must be hot-swapped.

Power supply units (FEP) installed on the PRIMEPOWER400 Pedestal Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform

hot-swapping. For details on how to swap power supply units, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

4.4.2 Adding CPU modules

A total of four CPU module slots are provided on the PRIMEPOWER400 Pedestal Server Systemboard.

When adding CPU modules the following restrictions apply:

- Only SPARC64 GP processors can be used.
- To ensure they all operate at the same clock speed, have the same cache size and use the same CPU stepping, the model name must be identical for all CPUs.
- CPU modules must be added according to Table 4.4 .

IMPORTANT

Operation for configurations other than those shown in Table 4.4 cannot be guaranteed.

Table 4.4 Allowed CPU Module Configurations

No. of CPUs	CPU slot #				No. of DDCs	DDCs to be added (incremental)
	#0	#1	#2	#3		
1	O	-	-	-	2	DDC #0, DDC #1
2	O	-	O	-	4	DDC #4, DDC #5
3	O	O	O	-	6	DDC #2, DDC #3
4	O	O	O	O	8	DDC #6, DDC #7

4.4.3 Adding memory modules

A total of 16 memory module slots are provided on the PRIMEPOWER400 Pedestal Server Systemboard.

When adding memory modules the following restrictions apply.

IMPORTANT

Operation for configuration other than those described below cannot be guaranteed.

- Each sequential group of 4 memory slots (#0-3, #4-7, #8-11, #12-15) must be either left empty or completely filled with 4 identical memory modules.

4.4.4 Adding hard disk drives

Disk drive configurations

Up to six hot-swappable UltraSCSI disk drives can be added to the PRIMEPOWER400 Pedestal Server. Each of the disk drive bays is provided with an ACTIVE LED and a FAULT LED.

The ACTIVE LED lights up (green) when a hard disk drive is operating (reading or writing). The FAULT LED lights up according to the swapping procedure when hot-swapping a hard disk drive.

Hot-swapping hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the PRIMEPOWER400 Pedestal Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE and FAULT LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

4.4.5 Adding PCI cards

There are three types of PCI card: a PCI card designed to operate in 3.3V slots, a PCI card designed to operate in 5V slots, and a PCI (universal) card design to operate in both 3.3V and 5V slots. Though most PCI cards operate at a 33MHz clock, some cards operate at a 66MHz clock.

Refer to Table 4.5 and Figure 4.9 below for details of the PCI slot positions when installing PCI cards.

Table 4.5 PCI Slot Specifications

PCI Slot number	PCI Bus	Slot / Card Width (bits)	PCI Clock Rate (MHz)	Card Input Voltage	long / short
10	F	64 / 32, 64	33	5V or Universal	long
9	E	64 / 32, 64	33	5V or Universal	long
8	E	64 / 32, 64	33	5V or Universal	long
7	E	64 / 32, 64	33	5V or Universal	long
6	D	64 / 32, 64	33 / 66	3.3V or Universal	long
5	C	64 / 32, 64	33 / 66	3.3V or Universal	long
4	B	64 / 32, 64	33 / 66	3.3V or Universal	long
3	A	64 / 32, 64	33	5V or Universal	long
2	A	64 / 32, 64	33	5V or Universal	long
1	A	64 / 32, 64	33	5V or Universal	long

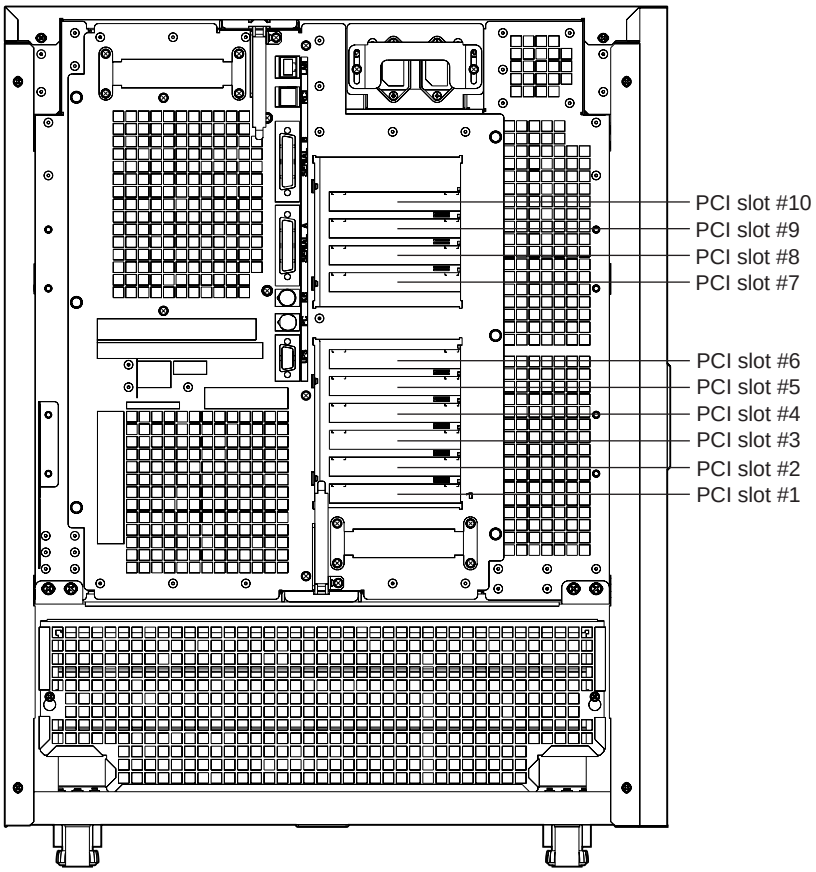


Figure 4.9 Rear of PRIMEPOWER400 Pedestal Server showing position of PCI slots

5

PRIMEPOWER400 Rackmount (4U) Server

This chapter gives an overview of the PRIMEPOWER400 Rackmount (4U) Main Server Unit, names and functions of parts, preparations for use, and how to expand the server unit.

CONTENTS

5.1 Overview 68
5.2 Names and Functions of Parts 68
5.3 Preparations for Use 73
5.4 Expanding the Server Unit 82

5.1 Overview

The following describes the key features and appearance of the PRIMEPOWER400 Rackmount (4U) Server.

Key Features

- The server unit can be configured with up to four CPUs.
- Up to 16 gigabytes of memory can be mounted.
- Six PCI slots (2 x 33/66MHz + 4 x 33MHz) are provided.
- Up to two UltraSCSI disk drives can be built in.
- One tape unit (DDS4 DAT or 8mm) can be installed.
- A CD-ROM drive is provided as standard.
- One 100Base-TX port, two serial ports (RS-232C) and one keyboard/mouse port are provided as standard.
- Redundant fan and N+1 redundant power supply configurations are supported.

Appearance

The following illustrations show the appearance of the PRIMEPOWER400 Rackmount (4U) Server.

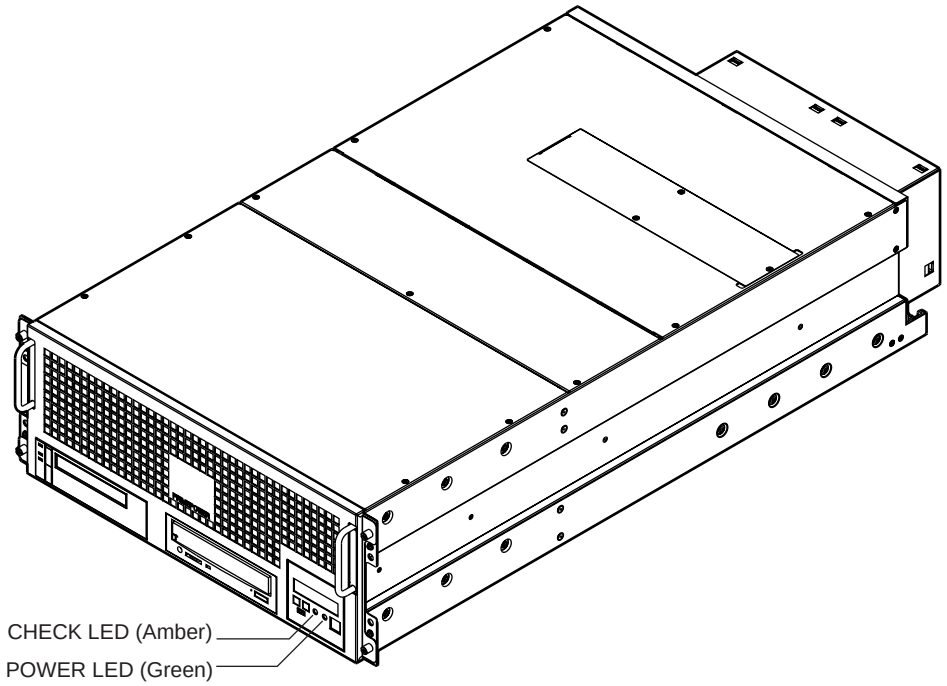


Figure 5.1 PRIMEPOWER400 Rackmount (4U) Server

5.2 Names and Functions of Parts

This section describes the names and functions of parts on the front, control panel and rear of the PRIMEPOWER400 Rackmount (4U) Server.

5.2.1 Front side

The names and functions of parts on the front of the PRIMEPOWER400 Rackmount (4U) Server are as follows.

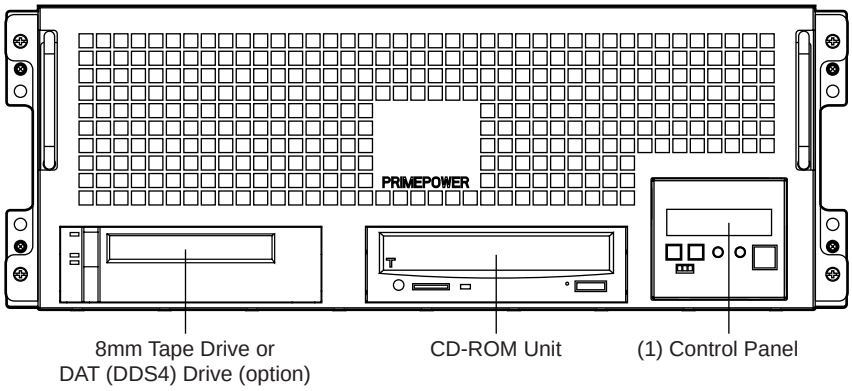


Figure 5.2 Front of PRIMEPOWER400 Rackmount (4U) Server

(1) Control panel

Contains various switches and indicator LEDs. See "5.2.2 Control Panel" for details.

5.2.2 Control panel

The PRIMEPOWER400 Rackmount (4U) Server is provided with the control panel shown in Figure 5.3 .

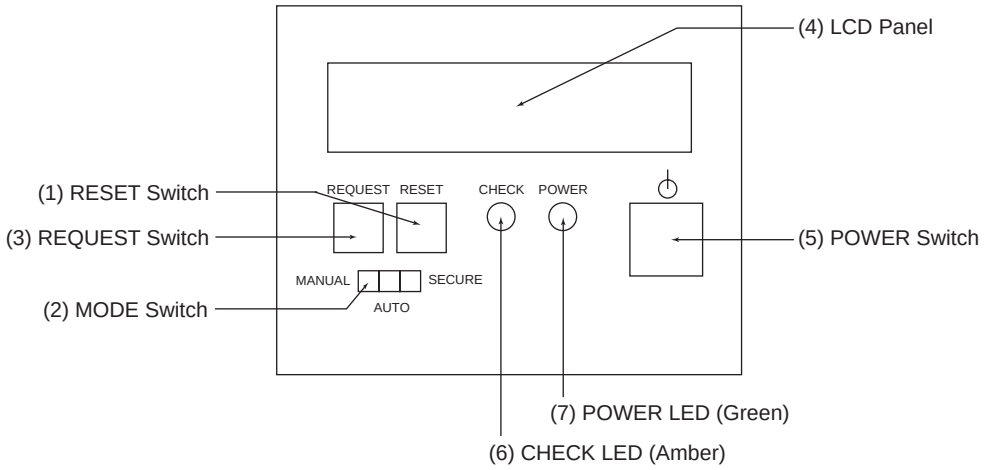


Figure 5.3 Control Panel

Note: To prevent erroneous operation, all push-button switches on the control panel are designed not to function unless held down for at least 0.3 seconds.

(1) RESET switch (push button)

⚠CAUTION

Data Destruction

Pressing the RESET switch while the system is running may cause data to be lost.

The RESET switch is used to reset the system to its initial state and is enabled or disabled by the MODE switch described in "(2) MODE switch".

(2) MODE switch (3-position slider)

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before operating the system. Without ether package, incorrect front panel operations and hardware errors may cause the system to shutdown or data to be lost.

The MODE switch has three settings and is used to specify the run mode at power on or system reboot, and to whether the POWER, RESET and REQUEST switches are "enabled" or "disabled".

Table 5.1 MODE Switch Settings

MODE switch	POWER switch	RESET switch	REQUEST switch	Operation mode
MANUAL	Enabled	Enabled	Enabled	The bootup sequence stops at an ok prompt after initial diagnostics are completed. Use this mode to enter commands and make settings from the ok prompt when performing maintenance on the server unit.
AUTO	Enabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed.
SECURE	Disabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed. The TTY terminal "break" and keyboard "STOP+A" commands are disabled while Solaris is operating.

(3) REQUEST switch (push button)

⚠CAUTION

Data Destruction

Pressing the REQUEST switch while the system is running may cause data to be lost.

The REQUEST switch is for outputting a memory dump when an error has occurred in the system. Only service engineers should operate the REQUEST switch.

(4) LCD panel

The 16-digit x 2-row LCD panel displays the status of initial diagnostics performed when the power is turned on.

It also displays error messages when a hardware error has been detected. For details on error messages that maybe displayed, see "13 Troubleshooting".

A LCD panel error message is cleared by one of the following:

- When the problem has been fixed
- When the power is next turned on
- When the main AC power is cut off.

Some displayed error messages may be cleared when the RESET switch is pressed.

(5) POWER switch (push button)

The POWER switch instructs the system to turn the power on and off.

Power on and off of expansion units (such as the Expansion Disk Cabinet) is interlocked with the powering on and off of the PRIMEPOWER400 Rackmount (4U) Server.

Operation of the POWER switch varies according to the MODE switch and scftool (software contained in the "Enhanced Support Facility") settings. For details, see "(2) MODE switch" and the "Enhanced Support Facility User's Guide."

(6) CHECK LED

IMPORTANT

When the PRIMEPOWER400 Rackmount (4U) Server detects an error in the power line or abnormal temperatures, the CHECK LED blinks and the power is automatically turned off to prevent unit damage and ensure safety.

The CHECK LED blinks or lights up when the PRIMEPOWER400 Rackmount (4U) Server detects an error.

When the power is turned on, the CHECK LED lights up and then goes out. This is not an error. If the CHECK LED stays lit and does not go out at power on, this indicates an error.

When an error occurs, note down the details displayed on the LCD panel, and contact a service engineer.

(7) POWER LED

The POWER LED indicates the power state of the system. This LED lights up when the power is on, and goes out when the power is turned off.

5.2.3 Rear side

The names and functions of parts on the rear of the PRIMEPOWER400 Rackmount (4U) Server are as follows.

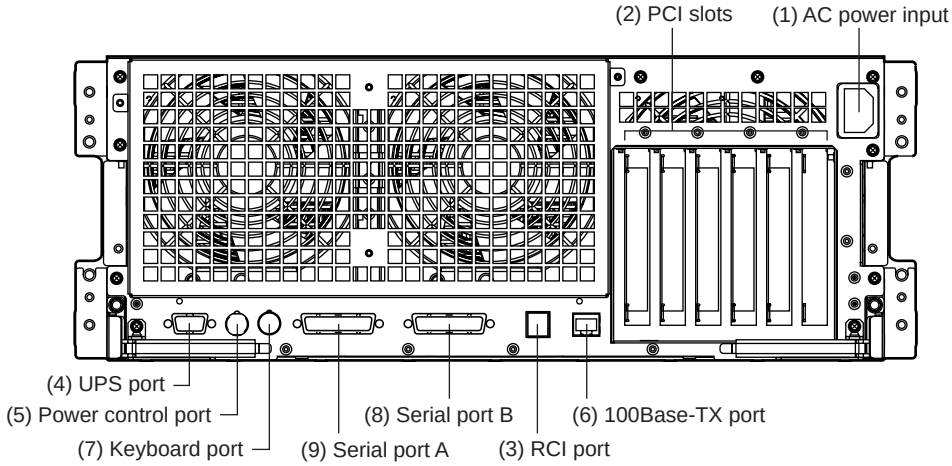


Figure 5.4 Rear of PRIMEPOWER400 Rackmount (4U) Server

(1) AC power input

Connect the power cable to this point.

(2) PCI slots

- PCI slots conform to the PCI local bus specifications (Rev. 2.1).
- 64-bit bus, 33MHz (5.0 V) and 33/66MHz (3.3V) are supported.
- Both short cards (17.46 cm, 6.87 in.) and long cards (31.19 cm, 12.3 in.) are supported.

(3) RCI port (label : RCI)

RJ11 connector for connecting the RCI cable and terminator (provided with the server unit)

(4) UPS port (label : UPS)

Dsub-9 pin for connecting the signal cable of an uninterruptible power supply

(5) Power control port (label : PC)

8-pin DIN for power control

(6) 100Base-TX ports (label : LAN)

RJ45 connector automatically recognizes 10Mbps/100Mbps

(7) Keyboard port (label : KB)

8-pin DIN port for connecting a keyboard cable

(8), (9) Serial port (label : SERIAL A/B)

Dsub-25 pin ports for connecting a console terminal when performing maintenance on the server unit using the RS-232C interface

5.3 Preparations for Use

This section describes the following:

- Installation notes and specifications
- Connecting the console
- Turning power on and off
- Installing the Enhanced Support Facility package
- Enabling/disabling the break signal
- LAN expansion note

5.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the PRIMEPOWER400 Rackmount (4U) Server may be damaged. Be sure to follow these notes.

Rack installation notes

The following instructions are intended to provide product safety requirements to be addressed when the end-use product manufacturer installs this product in their equipment.

- As the PRIMEPOWER400 Rackmount (4U) Server is installed in a closed or multi-unit rack assembly, the ambient operating temperature inside of the rack environment may be greater than the room temperature. So, consideration should be given to installing the PRIMEPOWER400 Rackmount (4U) Server in an environment compatible with the manufacturer's maximum rated ambient temperature.
  - Consideration for adjustment of air conditions like air circulation should be given to prevent the internal rack ambient temperature from exceeding the maximum operating temperature of this unit.
  - Maximum internal operating temperature of this unit: 35 deg. C (95 deg. F)
- Installation of the PRIMEPOWER400 Rackmount (4U) Server should be such that the amount of air flow required for safe operation of the PRIMEPOWER400 Rackmount (4U) Server is not compromised.
  - The PRIMEPOWER400 Rackmount (4U) Server has ventilation openings at the front and rear faces of the unit.
  - To prevent overheating, do not cover or close these ventilation openings.
- Mounting of the PRIMEPOWER400 Rackmount (4U) Server in the rack should be such that a hazardous condition does not result from uneven mechanical loading. To maintain the stability of the entire rack, please fix the rack to the wall or floor by suitable means.

  - Be careful of injuries during installation of the PRIMEPOWER400 Rackmount (4U) Server into the rack.
  - Do not install the PRIMEPOWER400 Rackmount (4U) Server into a rack if the server unit may make the entire rack unstable.
  - Maximum configured weight of this unit: 53 kg (116.99 lb.)

- If the PRIMEPOWER400 Rackmount (4U) Server is supplied with power from a power strip or service outlet of other units, it may overload the power supply cord or the power strip of other units.
  - Confirm that the current rating of the power strip or service outlet exceeds the combined ratings of all equipment it is supplying.
  - Electrical ratings of this unit: 100 to 240VAC, 8.9A to 3.7A, 50/60Hz, single-phase
- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to non-direct-to-mains connections (e.g. via power strips, etc.).

⚠CAUTION

Connect the ground before connecting any of the power supply lines. If all of the power cables are connected to a single power strip, high leakage current exceeding the stipulated value may leak through to the earth lead of the power strip.

If the power strip is not directly connected to the main distribution panel, use a power strip with an industrial plug.

General installation notes

- Do not block the ventilation holes.
- Do not install the PRIMEPOWER400 Rackmount (4U) Server where it will be exposed to sunlight or sources of heat.
- Do not install the PRIMEPOWER400 Rackmount (4U) Server in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the PRIMEPOWER400 Rackmount (4U) Server isolated from vibration. Install the PRIMEPOWER400 Rackmount (4U) Server on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the PRIMEPOWER400 Rackmount (4U) Server may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the PRIMEPOWER400 Rackmount (4U) Server. Do not use the top of the PRIMEPOWER400 Rackmount (4U) Server as a workspace.
- To prevent condensation in the PRIMEPOWER400 Rackmount (4U) Server, do not raise the ambient room temperature rapidly in winter.

  Use the PRIMEPOWER400 Rackmount (4U) Server only after it has warmed up sufficiently.
- Do not install the PRIMEPOWER400 Rackmount (4U) Server near EM noise generating devices such as photocopiers, air conditioners, or welders.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the PRIMEPOWER400 Rackmount (4U) Server to malfunction.
- When moving the PRIMEPOWER400 Rackmount (4U) Server, do not pull on the front cover. Otherwise, the Server may be damaged.

5.3.2 Installation specifications

Table 5.2 and Table 5.3 show the installation specifications for the PRIMEPOWER400 Rackmount (4U) Server.

Table 5.2 Installation Specifications of the PRIMEPOWER400 Rackmount (4U) Server (1/2)

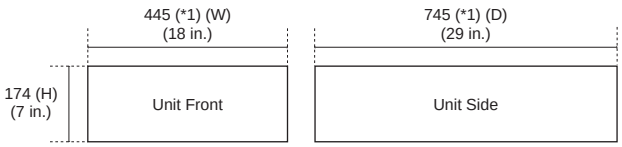
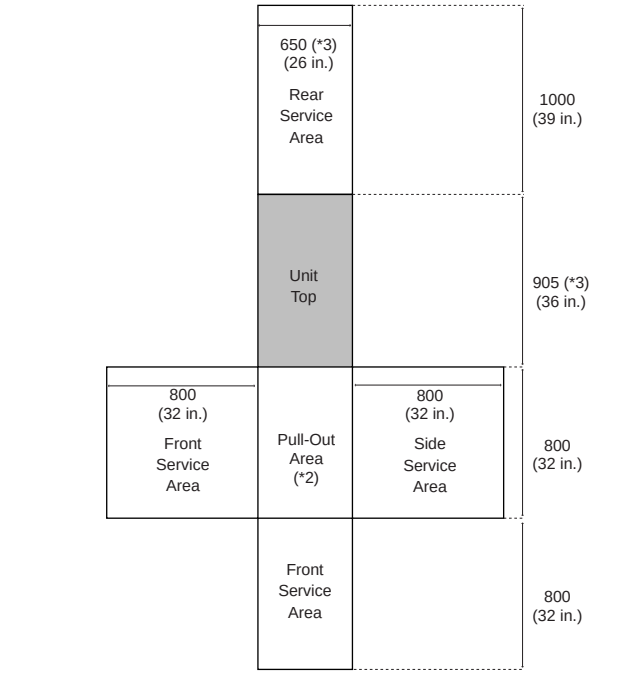
Item		Specification	
Weight		53 kg (116.99 lb.) (max.) (*1)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100 ~ 120V (±10%)	Single phase AC200 ~ 240V(±10%)
Max. Current		8.9 A (100V)	3.7 A (240V)
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*2)	
	Non-operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-operating	0.4 G	
Noise		50 db(A) (*3)	
Form Factor		Rackmount (4U)	

*1: Include Rack Rail weight.

*2: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*3: The indicated noise is the mean value of measurements obtained when the server unit is installed in an 1800mm (71-inch) rack server in a low-noise anechoic chamber. The actual noise measured at the installation site may be greater than the indicated value due to background noise and echoes.

Table 5.3 Installation Specifications of the PRIMEPOWER400 Rackmount (4U) Server (2/2)

Item	Specification
Unit Dimensions (units : mm)	
Service Areas (units : mm)	

*1: Not including any projections.

*2: Keep the pull-out area clear so that devices inside the PRIMEPOWER400 Rackmount (4U) Server can be pulled out from the rack cabinet to perform maintenance.

*3: When a GP7B7RK3x/RK4x rack cabinet is used

5.3.3 Connecting the console

A device such as a personal computer must be connected to the serial port to act as the console for a PRIMEPOWER400 Rackmount (4U) Server to which a display or keyboard is not connected. Pay attention to the following when connecting the console to the serial port on the PRIMEPOWER400 Rackmount (4U) Server.

Connect the serial cable:

Connect to serial A port.

Communication settings on the terminal:

Set to 8 bits, 1 stop bit, parity OFF, and 9600 baud.

5.3.4 Turning the power on

The following describes how to turn the power on.

⚠CAUTION

Data Destruction

Do not turn the console terminal (device connected to the serial port) on after turning the PRIMEPOWER Server on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

- If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.
- When the PRIMEPOWER Server is turned on, a self-diagnostics routine automatically verifies whether or not hardware errors are occurring. If this routine detects any hardware errors, system power is automatically turned off and on again (if the MODE switch on the control panel is set to AUTO or SECURE). This power off/on retry sequence is performed twice. In both retries, the routine checks for errors. If an error occurs in both cases, the routine judges that the system cannot be booted up and stops the system bootup sequence.

Procedure

1. Turn the AC main line power on.
2. Turn the power switches of the console terminal and peripheral devices on.

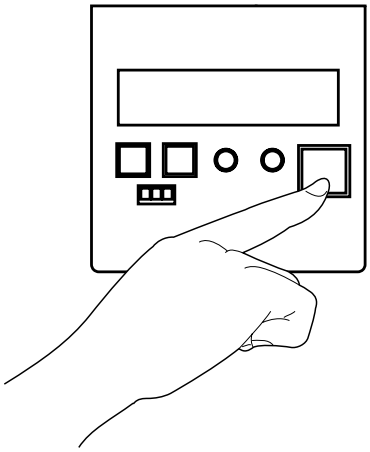


Figure 5.5 Turning the power on

3 Press the POWER switch on the control panel of the PRIMEPOWER400 Rackmount (4U) Server.

The POWER LEDs of the PRIMEPOWER Server and any peripheral devices connected via the RCI port should now light up.

Note: Operation of the POWER switch is disabled when the MODE switch is set to SECURE.

A keyboard power-on function is not supported.

5.3.5 Turning the power off

The following describes how to turn the power off.

⚠CAUTION

Data Destruction

Before turning the power off, check the answer to each of the following points is "No", or data may be lost:

- Are there any currently executing programs?
- Are there any current users?
- Are floppy disks or tape cartridges still inserted in their drives?

Backup files as necessary before turning the power off.

Also, do not turn off the console while the PRIMEPOWER Server is turned on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation potentially causing data to be lost.

IMPORTANT

If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.

Procedure

1. Press the POWER switch on the control panel of the PRIMEPOWER400 Rackmount (4U) Server.
2. Press the POWER switch again within five seconds (scftool default interval).

   This starts the system shutdown sequence. The power turns off after the system shuts down.

   For details on scftool, refer to the "User's Guide" included with the "Enhanced Support Facility."

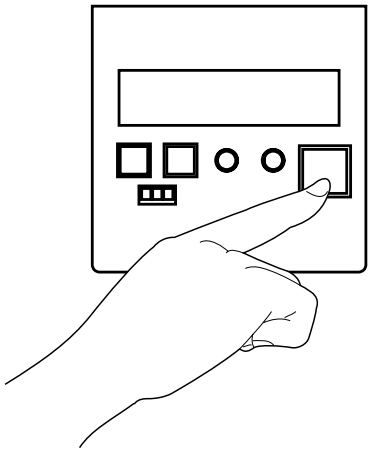


Figure 5.6 Turning the power off

3. Turn the power switches of peripheral devices off after the PRIMEPOWER400 Rackmount (4U) Server power has turned off.

5.3.6 Installing the Enhanced Support Facility package

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

With the PRIMEPOWER servers, be sure to install all of the programs provided with the "Enhanced Support Facility" to ensure the high reliability functions or the service processor. For details, refer to the "User's Guide" included with the "Enhanced Support Facility."

5.3.7 How to enable/disable the break signal

⚠CAUTION

Data Destruction

If improper commands are used at the ok prompt, data may be lost. If you need to use any command except those shown in this manual, you should fully understand the function and usage of the command before using it.

Data is sometimes lost as the bootup sequence shifts to display of the ok prompt during system operation in response to a break signal from the console terminal connected to the serial port or the STOP+A command from the keyboard.

To prevent this kind response to a break signal arriving from the serial port or the STOP+A command from the keyboard, make the following settings using the set-fw-options command shown below with the ok prompt displayed on screen, and then set the MODE switch on the control panel to the SECURE mode.

How to disable the break signal and STOP A command

1 Use the print-fw-options command to check the current setting.
The factory default is that nothing is set.

```
ok  print-fw-options
fw-options =
```

2 Use the set-fw-options command to set the value (no-break) for disabling the break signal and STOP command.

```
ok  set-fw-options no-break
fw-options = no-break
```

3 Use the print-fw-options command to make sure that no-break is correctly set.

```
ok  print-fw-options
fw-options = no-break
```

How to enable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting values. If the no-break shown below is not displayed, the break signal and STOP+A command are already enabled.

```
ok  print-fw-options
fw-options = no-break
```

2 Use the clear-fw-options command to cancel the no-break setting.

```
ok  clear-fw-options no-break
fw-options =
```

3 Use the print-fw-options command to make sure that nothing is set.

```
ok  print-fw-options
fw-options =
```

5.3.8 LAN expansion note

When LAN ports have seen added with PCI cards, and each LAN port given its own MAC address, these should be enabled from the ok prompt, as follows:

```
ok  setenv  local-mac-address?  true
```

5.4 Expanding the Server Unit

⚠CAUTION

The following operations should be performed by a service engineer, and not by the user. Otherwise, the product may malfunction.

- Mounting/removal of optional internal units

The following optional items can be added to the PRIMEPOWER400 Rackmount (4U) Server:

- Power supply units
- CPU modules
- Memory modules
- Hard disk drives
- PCI cards

Systemboard mounting locations are as follows:

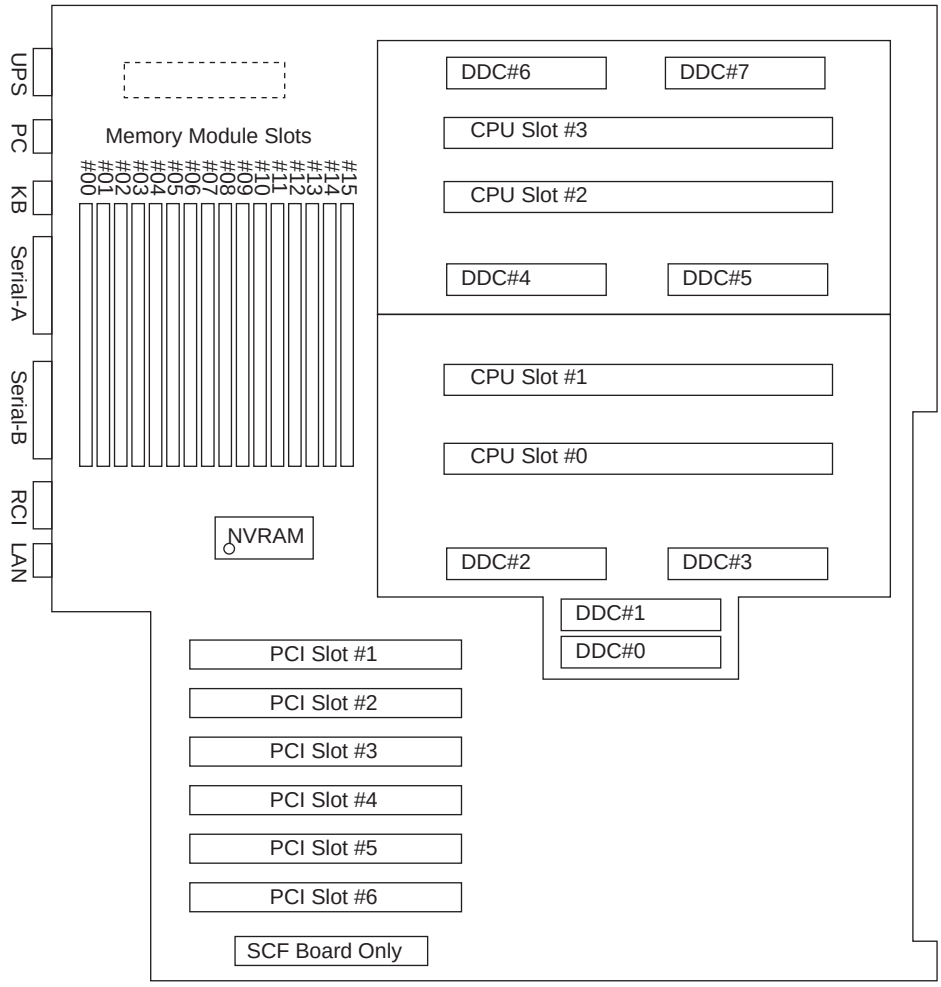


Figure 5.7 PRIMEPOWER400 Rackmount (4U) Systemboard

5.4.1 Adding power supply units

IMPORTANT

Adding an optional redundant power supply unit allows hot-swapping of the power supply units.

⚠CAUTION

Unit Damage

Power supply units may be damaged if hot-swapping of the power supply units is not performed correctly. Contact the service engineer if a power supply unit must be hot-swapped.

Power supply units (FEP) installed on the PRIMEPOWER400 Rackmount (4U) Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping. For details on how to swap power supply units, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

5.4.2 Adding CPU modules

A total of four CPU module slots are provided on the PRIMEPOWER400 Rackmount (4U) Systemboard.

When adding CPU modules the following restrictions apply:

- Only SPARC64 GP processors can be used.
- To ensure they all operate at the same clock speed, have the same cache size and use the same CPU stepping, the model name must be identical for all CPUs.
- CPU modules must be added according to Table 5.4 .

IMPORTANT

Operation for configurations other than those shown in Table 5.4 cannot be guaranteed.

Table 5.4 Allowed CPU Module Configurations

No. of CPUs	CPU slot #				No. of DDCs	DDCs to be added (incremental)
	#0	#1	#2	#3		
1	O	-	-	-	2	DDC #0, DDC #1
2	O	-	O	-	4	DDC #4, DDC #5
3	O	O	O	-	6	DDC #2, DDC #3
4	O	O	O	O	8	DDC #6, DDC #7

5.4.3 Adding memory modules

A total of 16 memory module slots are provided on the PRIMEPOWER400 Rackmount (4U) Systemboard.

When adding memory modules the following restrictions apply.

IMPORTANT

Operation for configuration other than those described below cannot be guaranteed.

- Each sequential group of 4 memory slots (#0-3, #4-7, #8-11, #12-15) must be either left empty or completely filled with 4 identical memory modules.

5.4.4 Adding hard disk drives

Disk drive configuration

Up to two hot-swappable UltraSCSI disk drives can be added to the PRIMEPOWER400 Rackmount (4U) Server. Each of the disk drive bays is provided with an ACTIVE LED and a FAULT LED.

The ACTIVE LED lights up (green) when a hard disk drive is operating (reading or writing). The FAULT LED lights up according to the swapping procedure when hot-swapping a hard disk drive.

Hot-swapping hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the PRIMEPOWER400 Rackmount (4U) Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE and FAULT LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

5.4.5 Adding PCI cards

There are three types of PCI card: a PCI card designed to operate in 3.3V slots, a PCI card designed to operate in 5V slots, and a PCI (universal) card design to operate in both 3.3V and 5V slots. Though most PCI cards operate at a 33MHz clock, some cards operate at a 66MHz clock.

Refer to Table 5.5 and Figure 5.8 below for details of the PCI slot positions when installing PCI cards.

Table 5.5 PCI Slot Specifications

PCI Slot number	PCI Bus	Slot / Card Width (bits)	PCI Clock Rate (MHz)	Card Input Voltage	long / short
6	D	64 / 32, 64	33	5V or Universal	long
5	B	64 / 32, 64	33	5V or Universal	long
4	C	64 / 32, 64	33 / 66	3.3V or Universal	long
3	B	64 / 32, 64	33	5V or Universal	short
2	B	64 / 32, 64	33	5V or Universal	short
1	A	64 / 32, 64	33 / 66	3.3V or Universal	short

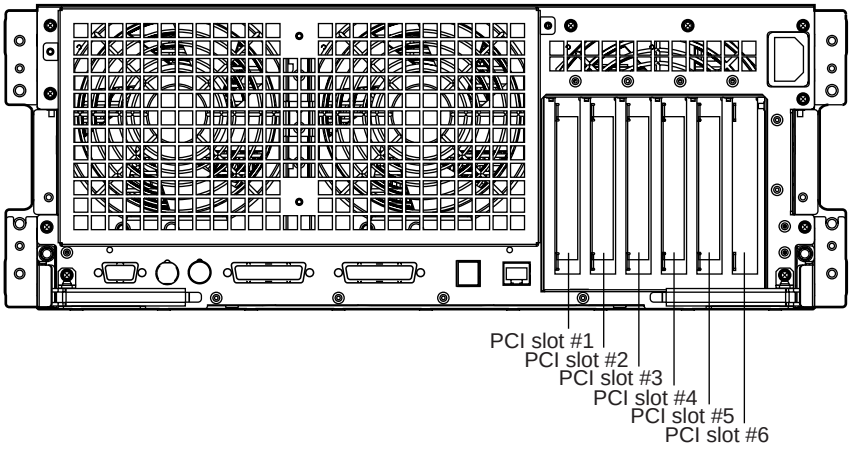


Figure 5.8 Rear of PRIMEPOWER400 Rackmount (4U) showing position of PCI slots

6

PRIMEPOWER400 Rackmount (10U) Server

This chapter gives an overview of the PRIMEPOWER400 Rackmount (10U) Server, names and functions of parts, preparations for use, and how to expand the server unit.

CONTENTS

6.1 Overview 90
6.2 Names and Functions of Parts 91
6.3 Preparations for Use 96
6.4 Expanding the Server Unit 107

6.1 Overview

The following describes the key features and appearance of the PRIMEPOWER400 Rackmount (10U) Server.

Key Features

- The server unit can be configured with up to four CPUs.
- Up to 16 gigabytes of memory can be mounted.
- Ten PCI slots (3 x 33/66MHz + 7 x 33MHz) are provided.
- Up to six UltraSCSI disk drives can be built in.
- One tape unit (DDS4 DAT, 8mm or DLT) can be installed.
- A CD-ROM drive is provided as standard.
- One 100Base-TX port, two serial ports (RS-232C) and one keyboard/mouse port are provided as standard.
- A redundant fan configuration and N+1 redundant power supply configuration are supported.

Appearance

The following illustration shows the appearance of the PRIMEPOWER400 Rackmount (10U) Server.

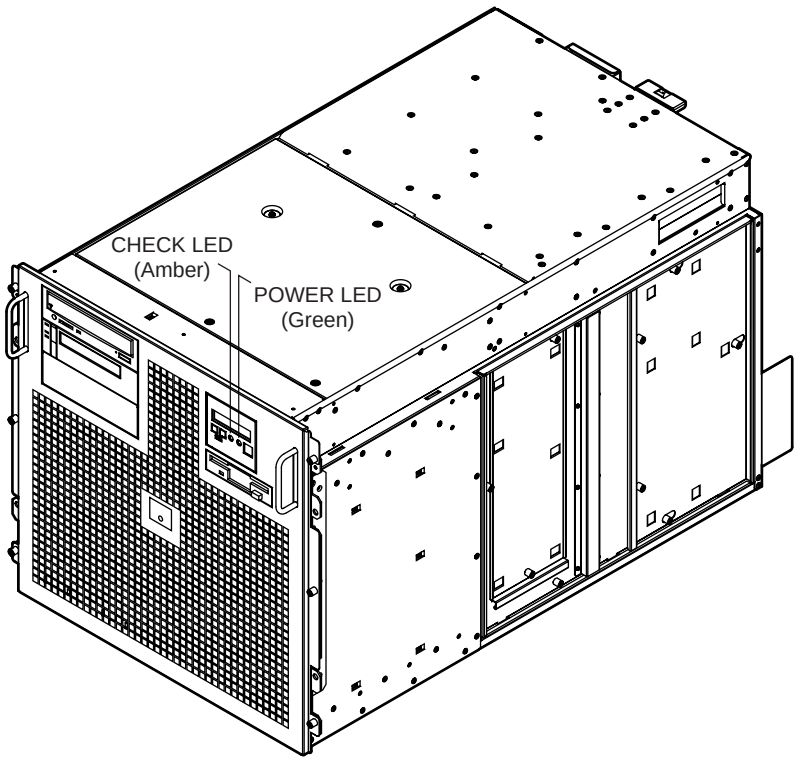


Figure 6.1 PRIMEPOWER400 Rackmount (10U) Server

6.2 Names and Functions of Parts

This section describes the names and functions of parts on the front, control panel and rear of the PRIMEPOWER400 Rackmount (10U) Server.

6.2.1 Front side

The names and functions of parts on the front of the PRIMEPOWER400 Rackmount (10U) Server are as follows:

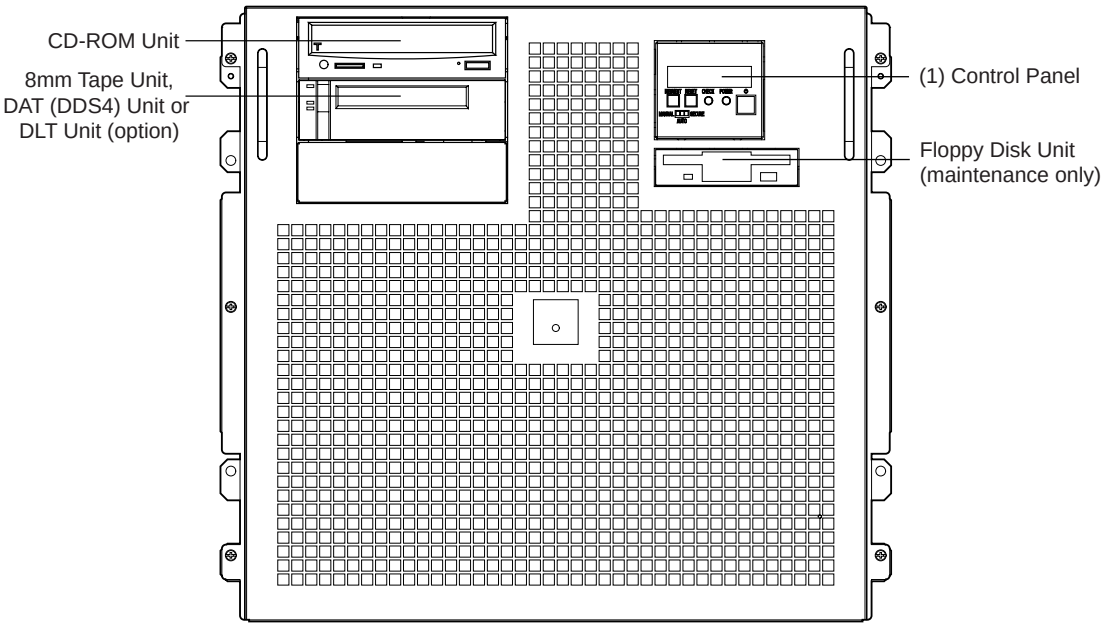


Figure 6.2 Front of PRIMEPOWER400 Rackmount (10U) Server

(1) Control panel

Contains various switches and indicator LEDs. See "6.2.2 Control Panel" for details.

6.2.2 Control panel

The PRIMEPOWER400 Rackmount (10U) Server is provided with the control panel shown in Figure 6.3 .

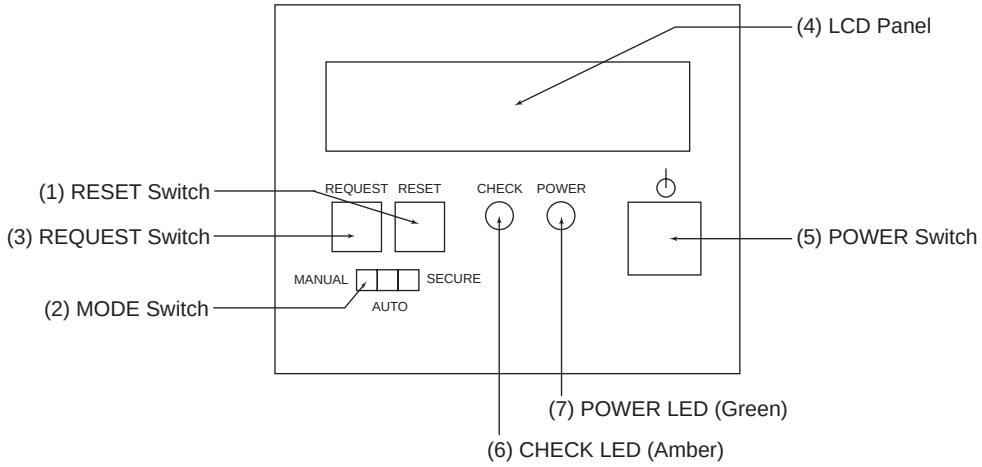


Figure 6.3 Control Panel

Note: To prevent erroneous operation, all push-button switches on the control panel are designed not to function unless held down for at least 0.3 seconds.

(1) RESET switch (push button)

⚠CAUTION

Data Destruction

Pressing the RESET switch while the system is running may cause data to be lost.

The RESET switch is used to reset the system to its initial state and is enabled or disabled by the MODE switch described in "(2) MODE switch".

(2) MODE switch (3-position slider)

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

The MODE switch has three settings and is used to specify the run mode at power on or system reboot, and to whether the POWER, RESET and REQUEST switches are "enabled" or "disabled".

Table 6.1 MODE Switch Settings

MODE switch	POWER switch	RESET switch	REQUEST switch	Operation mode
MANUAL	Enabled	Enabled	Enabled	The bootup sequence stops at an ok prompt after initial diagnostics are completed. Use this mode to enter commands and make settings from the ok prompt when performing maintenance on the server unit.
AUTO	Enabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed.
SECURE	Disabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed. The TTY terminal "break" and keyboard "STOP+A" commands are disabled while Solaris is operating.

(3) REQUEST switch (push button)

⚠CAUTION

Data Destruction

Pressing the REQUEST switch while the system is running may cause data to be lost.

The REQUEST switch is for outputting a memory dump when an error has occurred in the system. Only service engineers should operate the REQUEST switch.

(4) LCD panel

The 16-digit x 2-row LCD panel displays the status of initial diagnostics performed when the power is turned on.

It also displays error messages when a hardware error has been detected. For details on error messages that maybe displayed, see "13 Troubleshooting".

A LCD panel error message is cleared by one of the following:

- When the problem has been fixed
- When the power is next turned on
- When the main AC power is cut off.

Some displayed error messages may be cleared when the RESET switch is pressed.

(5) POWER switch (push button)

The POWER switch instructs the system to return the power on and off.

Power on and off of expansion units (such as the Expansion Disk Cabinet) is interlocked with the powering on and off of the PRIMEPOWER400 Rackmount (10U) Server.

Operation of the POWER switch varies according to the MODE switch and scftool (software contained in the "Enhanced Support Facility") settings. For details, see "(2) MODE switch" and the "Enhanced Support Facility User’s Guide."

(6) CHECK LED

IMPORTANT

When the PRIMEPOWER400 Rackmount (10U) Server detects an error in the power line or abnormal temperatures, the CHECK LED blinks and the power is automatically turned off to prevent unit damage and ensure safety.

The CHECK LED blinks or lights up when the PRIMEPOWER400 Rackmount (10U) Server detects an error.

When the power is turned on, the CHECK LED lights up and then goes out. This is not an error. If the CHECK LED stays lit and does not go out at power on, this indicates an error.

When an error occurs, note down the details displayed on the LCD panel, and contact a service engineer.

(7) POWER LED

The POWER LED indicates the power state of the system. This LED lights up when the power is on, and goes out when the power is turned off.

6.2.3 Rear side

The names and functions of parts on the rear of the PRIMEPOWER400 Rackmount (10U) Server are as follows.

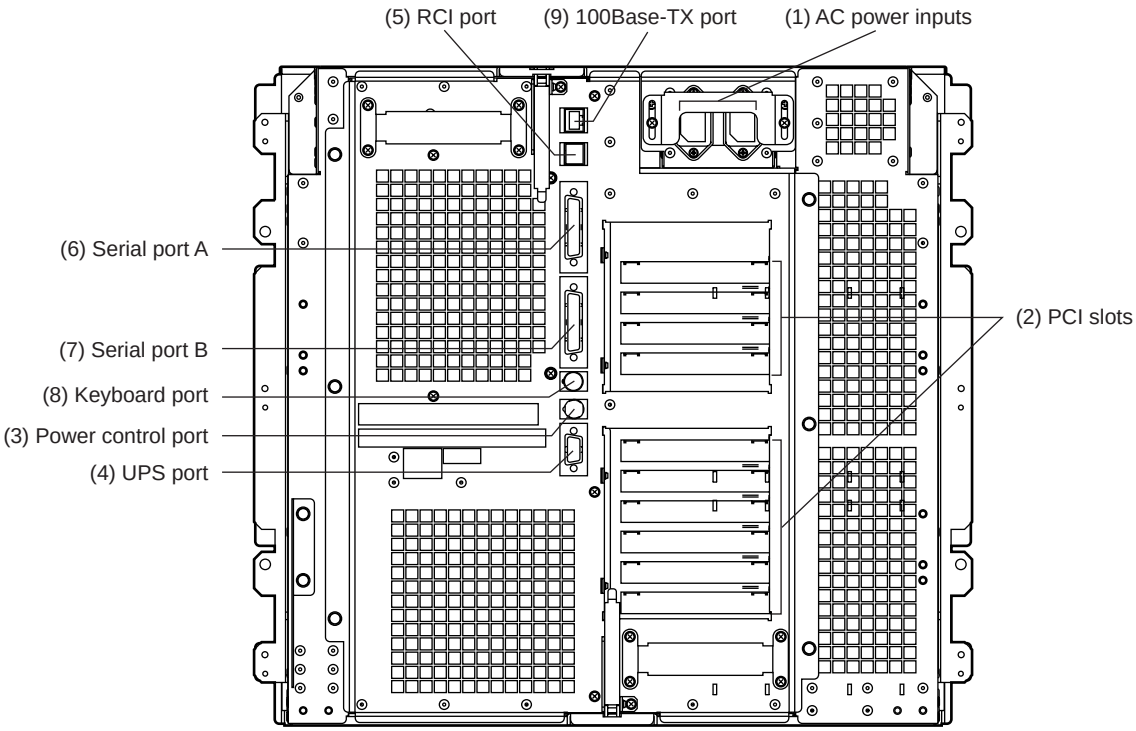


Figure 6.4 Rear of PRIMEPOWER400 Rackmount (10U) Server

(1) AC power inputs

Connect the power cables to these points. Both AC power cords must be plugged into the same power grid / circuit.

(2) PCI slots (option)

- PCI slots conform to PCI local bus specifications (Rev. 2.1).
- 64-bit bus, 33MHz (5.0 V) and 33/66MHz (3.3V) are supported.
- Both short cards (17.46 cm, 6.87 in.) and long cards (31.19 cm, 12.3 in.) are supported.

(3) Power control switch (label : PC)

8-pin DIN for power control

(4) UPS port (label : UPS)

Dsub-9 pin for connecting the signal cable of an uninterruptible power supply

(5) RCI port (label : RCI)

RJ11 connector for connecting the RCI cable and terminator (provided with the server unit)

(6), (7) Serial ports (label : SERIAL A/B)

Dsub-25 pin port for connecting a console terminal when performing maintenance on the server unit using the RS-232C interface

(8) Keyboard port (label : KB)

8-pin DIN port for connecting a keyboard cable

(9) 100Base-TX ports (label : LAN)

RJ45 connector automatically recognizes 10Mbps/100Mbps.RJ45 connector (10) is available when the system expansion board is installed.

6.3 Preparations for Use

This section describes the following:

- Installation notes and specifications
- Connecting the console
- Turning power on and off
- Installing the Enhanced Support Facility package
- Enabling/disabling the break signal
- LAN expansion note

6.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the PRIMEPOWER400 Rackmount (10U) Server may be damaged. Be sure to follow these notes.

Rack installation notes

The following instructions are intended to provide product safety requirements to be addressed when the end-use product manufacturer installs this product in their equipment.

- As the PRIMEPOWER400 Rackmount (10U) Server is installed in a closed or multi-unit rack assembly, the ambient operating temperature inside of the rack environment may be greater than the room temperature. So, consideration should be given to installing the PRIMEPOWER400 Rackmount (10U) Server in an environment compatible with the manufacturer's maximum rated ambient temperature.
  - Consideration for adjustment of air conditions like air circulation should be given to prevent the internal rack ambient temperature from exceeding the maximum operating temperature of this unit.
  - Maximum internal operating temperature of this unit: 35 deg. C (95 deg. F)
- Installation of the PRIMEPOWER400 Rackmount (10U) Server should be such that the amount of air flow required for safe operation of the PRIMEPOWER400 Rackmount (10U) Server is not compromised.
  - The PRIMEPOWER400 Rackmount (10U) Server has ventilation openings at the front and rear faces of the unit.
  - To prevent overheating, do not cover or close these ventilation openings.
- Mounting of the PRIMEPOWER400 Rackmount (10U) Server in the rack should be such that a hazardous condition does not result from uneven mechanical loading. To maintain the stability of the entire rack, please fix the rack to the wall or floor by suitable means.

  - Be careful of injuries during installation of the PRIMEPOWER400 Rackmount (10U) Server into the rack.
  - Do not install the PRIMEPOWER400 Rackmount (10U) Server into a rack if the server unit may make the entire rack unstable.
  - Maximum configured weight of this unit: 102 kg (225.17 lb.)

- If the PRIMEPOWER400 Rackmount (10U) Server is supplied with power from a power strip or service outlet of other units, it may overload the power supply cord or the power strip of other units.
  - Confirm that the current rating of the power strip or service outlet exceeds the combined ratings of all equipment it is supplying.
  - Electrical ratings of this unit: 100 to 240VAC, 12.0A to 6.0A, 50/60Hz, single-phase
- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to non-direct-to-mains connections (e.g. via power strips, etc.).

⚠CAUTION

Connect the ground before connecting any of the power supply lines. If all of the power cables from the Expansion File Unit Type-2 are connected to a single power strip, high leakage current exceeding the stipulated value may leak through to the earth lead of the power strip.

If the power strip is not directly connected to the main distribution panel, use a power strip with an industrial plug.

General installation notes

- Do not block the ventilation holes.
- Do not install the PRIMEPOWER400 Rackmount (10U) Server where it will be exposed to sunlight or sources of heat.
- Do not install the PRIMEPOWER400 Rackmount (10U) Server in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the PRIMEPOWER400 Rackmount (10U) Server isolated from vibration. Install the PRIMEPOWER400 Rackmount (10U) Server on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the PRIMEPOWER400 Rackmount (10U) Server may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the PRIMEPOWER400 Rackmount (10U) Server. Do not use the top of the PRIMEPOWER400 Rackmount (10U) Server as a workspace.
- To prevent condensation in the PRIMEPOWER400 Rackmount (10U) Server, do not raise the ambient room temperature rapidly in winter.
  Use the PRIMEPOWER400 Rackmount (10U) Server only after it has warmed up sufficiently.

- Do not install the PRIMEPOWER400 Rackmount (10U) Server near EM noise generating devices such as photocopiers, air conditioners, or welders.
- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the PRIMEPOWER400 Rackmount (10U) Server to malfunction.
- When moving the PRIMEPOWER400 Rackmount (10U) Server, do not pull on the front cover. Otherwise, the Server may be damaged.

6.3.2 Installation specifications

Table 6.2 and Table 6.3 show the installation specifications for the PRIMEPOWER400 Rackmount (10U) Server.

Table 6.2 Installation Specifications of the PRIMEPOWER400 Rackmount (10U) Server (1/2)

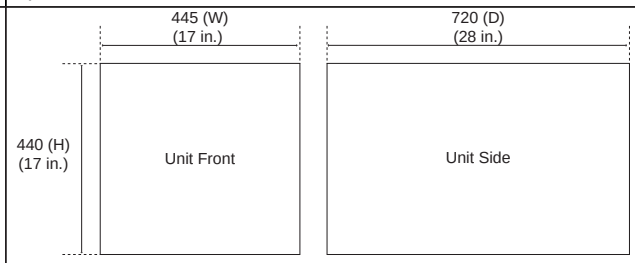
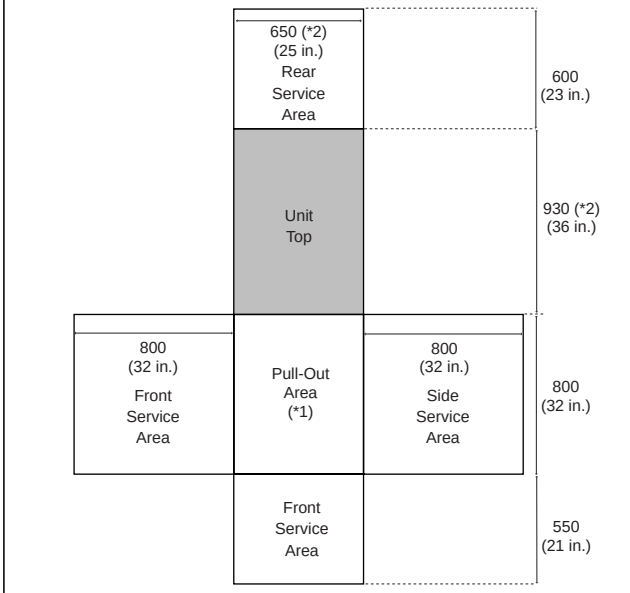
Item		Specification	
Weight		102 kg (225.17 lb.) (max.) (*1)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100V (±10%)	Single phase AC200V (±10%)
Max. Current		12.0 A	6.0 A
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*2)	
	Non-operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-operating	0.4 G	
Noise		50 db(A) (*3)	
Form Factor		Rackmount (10U)	

*1: Include Rack Rail weight.

*2: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*3: The indicated noise is the mean value of measurements obtained when the server unit is installed in an 1800mm (71-inch) rack server in a low-noise anechoic chamber. The actual noise measured at the installation site may be greater than the indicated value due to background noise and echoes.

Table 6.3 Installation Specifications of the PRIMEPOWER400 Rackmount (10U) Server (2/2)

Item	Specification
Unit Dimensions (units : mm)	
Service Areas (units : mm)	

*1: Not including any projections.

*2: Keep the pull-out area clear so that devices inside the PRIMEPOWER400 Rackmount (10U) Server can be pulled out from the rack cabinet when performing maintenance.

*3: When a GP7B7RK3x/RK4x rack cabinet is used

6.3.3 Connecting the console

A device such as a personal computer must be connected to the serial port to act as the console for PRIMEPOWER400 Rackmount (10U) Server to which a display or keyboard is not connected. Pay attention to the following when connecting the console to the serial port on the PRIMEPOWER400 Rackmount (10U) Server.

Connect the serial cable:

Connect to serial A port.

Communication settings on the terminal:

Set to 8 bits, 1 stop bit, parity OFF, and 9600 baud.

6.3.4 Turning the power on

The following describes how to turn the power on.

⚠CAUTION

Data Destruction

Do not turn the console terminal (device connected to the serial port) on after turning the PRIMEPOWER Server on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

- If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.
- When the PRIMEPOWER Server is turned on, a self-diagnostics routine automatically verifies whether or not hardware errors are occurring. If this routine detects any hardware errors, system power is automatically turned off and on again (if the MODE switch on the control panel is set to AUTO or SECURE). This power off/on retry sequence is performed twice. In both retries, the routine checks for errors. If an error occurs in both cases, the routine judges that the system cannot be booted up and stops the system bootup sequence.

Procedure

1. Turn the AC main line power on.
2. Turn the power switches of the console terminal and peripheral devices on.

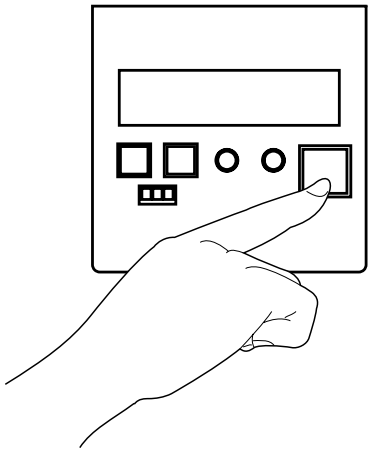


Figure 6.5 Turning the power on

3 Press the POWER switch on the control panel of the PRIMEPOWER400 Rackmount (10U) Server.

The POWER LEDs of the PRIMEPOWER Server and any peripheral devices connected via the RCI port should now light up.

Note: Operation of the POWER switch is disabled when the MODE switch is set to SECURE.

A keyboard power-on function is not supported.

6.3.5 Turning the power off

The following describes how to turn the power off.

⚠CAUTION

Data Destruction

Before turning the power off, check the answer to each of the following points is "No", or data may be lost:

- Are there any currently executing programs?
- Are there any current users?
- Are floppy disks or tape cartridges still inserted in their drives?

Backup files as necessary before turning the power off.

Also, do not turn off the console while the PRIMEPOWER Server is turned on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.

Procedure

1. Press the POWER switch on the control panel of the PRIMEPOWER400 Rackmount (10U) Server.
2. Press the POWER switch again within five seconds (scftool default interval).

   This starts the system shutdown sequence. The power turns off after the system shuts down.

   For details on scftool, refer to the "User’s Guide" included with the "Enhanced Support Facility."

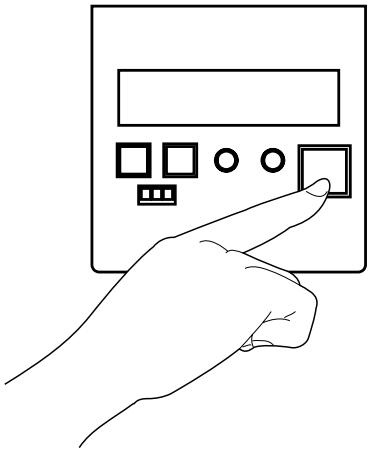


Figure 6.6 Turning the power off

3 Turn the power switches of peripheral devices off after the PRIMEPOWER400 Rackmount (10U) Server power has turned off.

6.3.6 Installing the Enhanced Support Facility package

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

With the PRIMEPOWER servers, be sure to install all of the programs provided with the "Enhanced Support Facility" to ensure the high-reliability functions of the service processor. For details, refer to the "User's Guide" included with the "Enhanced Support Facility."

6.3.7 How to enable/disable the break signal

⚠CAUTION

Data Destruction

If improper commands are used at the ok prompt, data may be lost. If you need to use any command except those shown in this manual, you should fully understand the function and usage of the command before using it.

Data is sometimes lost as the bootup sequence shifts to display of the ok prompt during system operation in response to a break signal from the console terminal connected to the serial port or the STOP+A command from the keyboard.

To prevent this kind response to a break signal arriving from the serial port or the STOP+A command from the keyboard, make the following settings using the set-fw-options command shown below with the ok prompt displayed on screen, and then set the MODE switch on the control panel to the SECURE mode.

How to disable the break signal and STOP A command

1 Use the print-fw-options command to check the current setting.
The factory default is that nothing is set.

```
ok  print-fw-options
fw-options =
```

2 Use the set-fw-options command to set the value (no-break) for disabling the break signal and STOP command.

```
ok  set-fw-options no-break
fw-options = no-break
```

3 Use the print-fw-options command to make sure that no-break is correctly set.

```
ok  print-fw-options
fw-options = no-break
```

How to enable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting values. If the no-break shown below is not displayed, the break signal and STOP+A command are already enabled.

```
ok  print-fw-options
fw-options = no-break
```

2 Use the clear-fw-options command to cancel the no-break setting.

```
ok  clear-fw-options no-break
fw-options =
```

3 Use the print-fw-options command to make sure that nothing is set.

```
ok  print-fw-options
fw-options =
```

6.3.8 LAN expansion note

When LAN ports have seen added with PCI cards, and each LAN port given its own MAC address, these should be enabled from the ok prompt, as follows:

```
ok  setenv  local-mac-address?  true
```

6.4 Expanding the Server Unit

⚠CAUTION

The following operations should be performed by a service engineer, and not by the user. Otherwise, the product may malfunction.

- Mounting/removal of optional internal units

The following optional items can be added to the PRIMEPOWER400 Rackmount (10U) Server:

- Power supply units
- CPU modules
- Memory modules
- Hard disk drives
- PCI cards

Systemboard mounting locations are as follows:

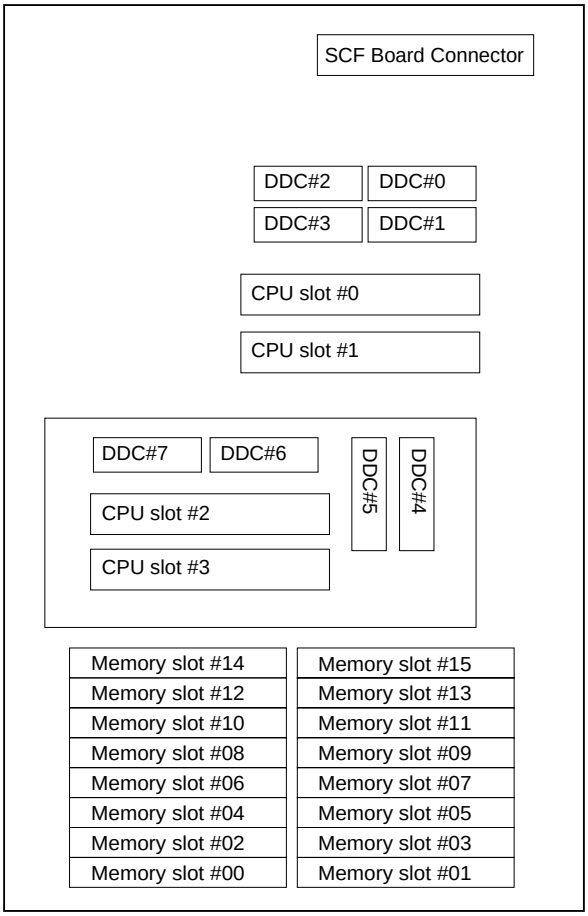


Figure 6.7 PRIMEPOWER400 Rackmount (10U) Systemboard

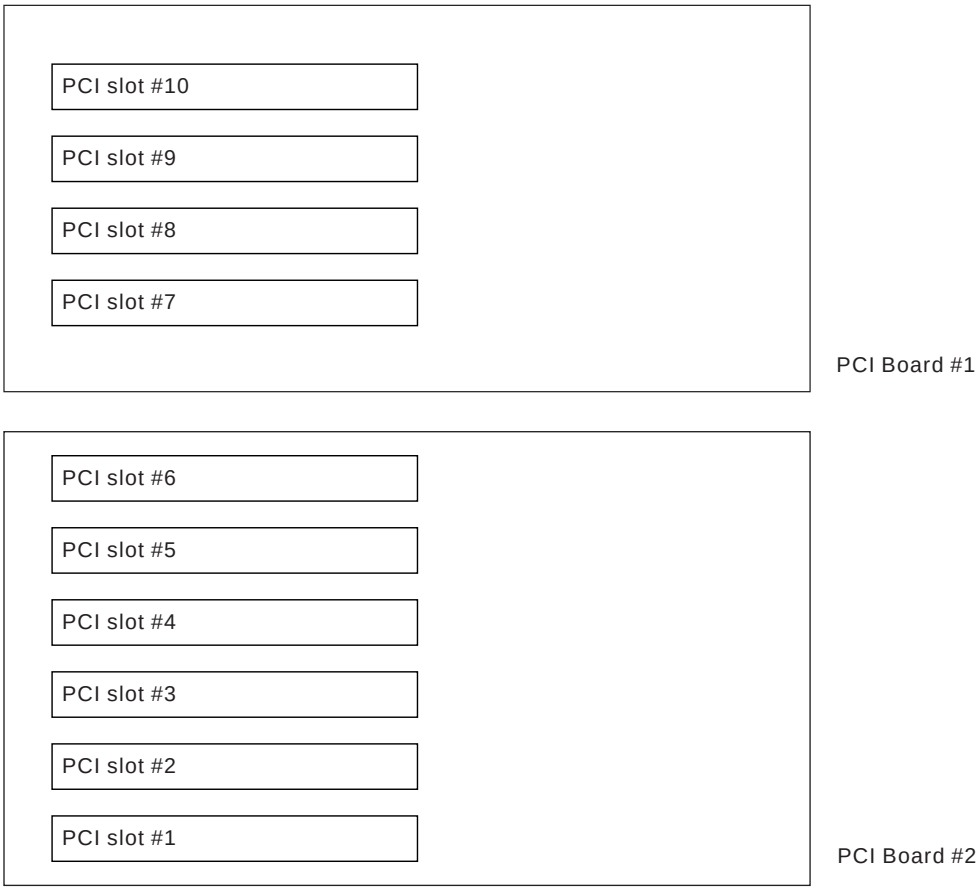


Figure 6.8 PRIMEPOWER400 Rackmount (10U) PCI boards

6.4.1 Adding power supply units

IMPORTANT

Adding an optional redundant power supply unit allows hot-swapping of the power supply units.

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of the power supply units is not performed correctly. Contact the service engineer if a power supply unit must be hot-swapped.

Power supply units (FEP) installed on the PRIMEPOWER400 Rackmount (10U) Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping. For details on how to swap power supply units, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

6.4.2 Adding CPU modules

A total of four CPU module slots are provided on the PRIMEPOWER400 Rackmount (10U) Systemboard.

When adding CPU modules the following restrictions apply:

- Only SPARC64 GP processors can be used.
- To ensure they all operate at the same clock speed, have the same cache size and use the same CPU stepping, the model name must be identical for all CPUs.
- CPU modules must be added according to Table 6.4 .

IMPORTANT

Operation for configurations other than those shown in Table 6.4 cannot be guaranteed.

Table 6.4 Allowed CPU Module Configurations

No. of CPUs	CPU slot #				No. of DDCs	DDCs to be added (incremental)
	#0	#1	#2	#3		
1	O	-	-	-	2	DDC #0, DDC #1
2	O	-	O	-	4	DDC #4, DDC #5
3	O	O	O	-	6	DDC #2, DDC #3
4	O	O	O	O	8	DDC #6, DDC #7

6.4.3 Adding memory modules

A total of 16 memory module slots are provided on the PRIMEPOWER400 Rackmount (10U) Systemboard.

When adding memory modules the following restrictions apply.

IMPORTANT

Operation for configuration other than those described below cannot be guaranteed.

- Each sequential group of 4 memory slots (#0-3, #4-7, #8-11, #12-15) must be either left empty or completely filled with 4 identical memory modules.

6.4.4 Adding hard disk drives

Disk drive configuration

Up to six hot-swappable UltraSCSI disk drives can be added to the PRIMEPOWER400 Rackmount (10U) Server. Each of the disk drive bays is provided with an ACTIVE LED and a FAULT LED.

The ACTIVE LED lights up (green) when a hard disk drive is operating (reading or writing). The FAULT LED lights up according to the swapping procedure when hot-swapping a hard disk drive.

Hot-swapping hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the PRIMEPOWER400 Rackmount (10U) Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE and FAULT LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

6.4.5 Adding PCI cards

There are three types of PCI card: a PCI card designed to operate in 3.3V slots, a PCI card designed to operate in 5V slots, and a PCI (universal) card design to operate in both 3.3V and 5V slots. Though most PCI cards operate at a 33MHz clock, some cards operate at a 66MHz clock.

Refer to Table 6.5 and Figure 6.9 below for details of the PCI slot positions when installing PCI cards.

Table 6.5 PCI Slot Specifications

PCI Slot number	PCI Bus	Slot / Card Width (bits)	PCI Clock Rate (MHz)	Card Input Voltage
10	F	64 / 32, 64	33	5V or Universal
9	E	64 / 32, 64	33	5V or Universal
8	E	64 / 32, 64	33	5V or Universal
7	E	64 / 32, 64	33	5V or Universal
6	D	64 / 32, 64	33 / 66	3.3V or Universal
5	C	64 / 32, 64	33 / 66	3.3V or Universal
4	B	64 / 32, 64	33 / 66	3.3V or Universal
3	A	64 / 32, 64	33	5V or Universal
2	A	64 / 32, 64	33	5V or Universal
1	A	64 / 32, 64	33	5V or Universal

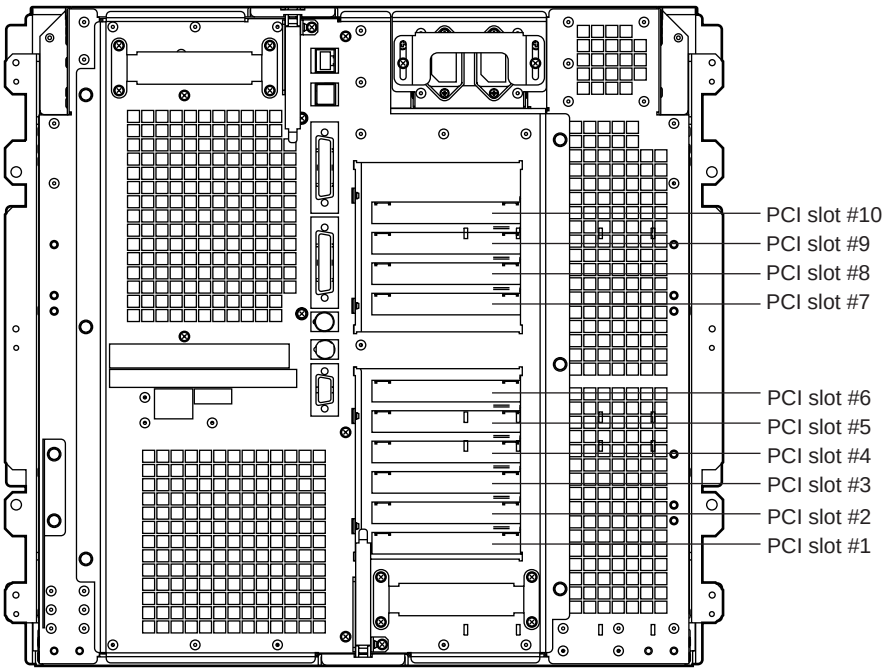


Figure 6.9 Rear of PRIMEPOWER400 Rackmount (10U) showing position of PCI slots

7

PRIMEPOWER600 Pedestal Server

This chapter gives an overview of the PRIMEPOWER600 Pedestal Server, names and functions of parts, preparations for use, and how to expand the server unit.

CONTENTS

7.1 Overview 116
7.2 Names and Functions of Parts 117
7.3 Preparations for Use 122
7.4 Expanding the Server Unit 132

7.1 Overview

The following describes the key features and appearance of the PRIMEPOWER600 Pedestal Server.

Key Features

- The server unit can be configured with up to eight CPUs.
- Up to 32 gigabytes of memory can be mounted.
- Up to twelve PCI slots (4 x 33/66MHz + 8 x 33MHz) are provided.
- Up to six UltraSCSI disk drives can be built in.
- One tape unit (DDS4 DAT, 8mm or DLT) can be installed.
- A CD-ROM drive is provided as standard.
- One 100Base-TX port, two serial ports (RS-232C) and one keyboard/mouse port are provided as standard.
- Redundant fan and N+1 redundant power supply configurations are supported.

Appearance

The following illustration shows the appearance of the PRIMEPOWER600 Pedestal Server.

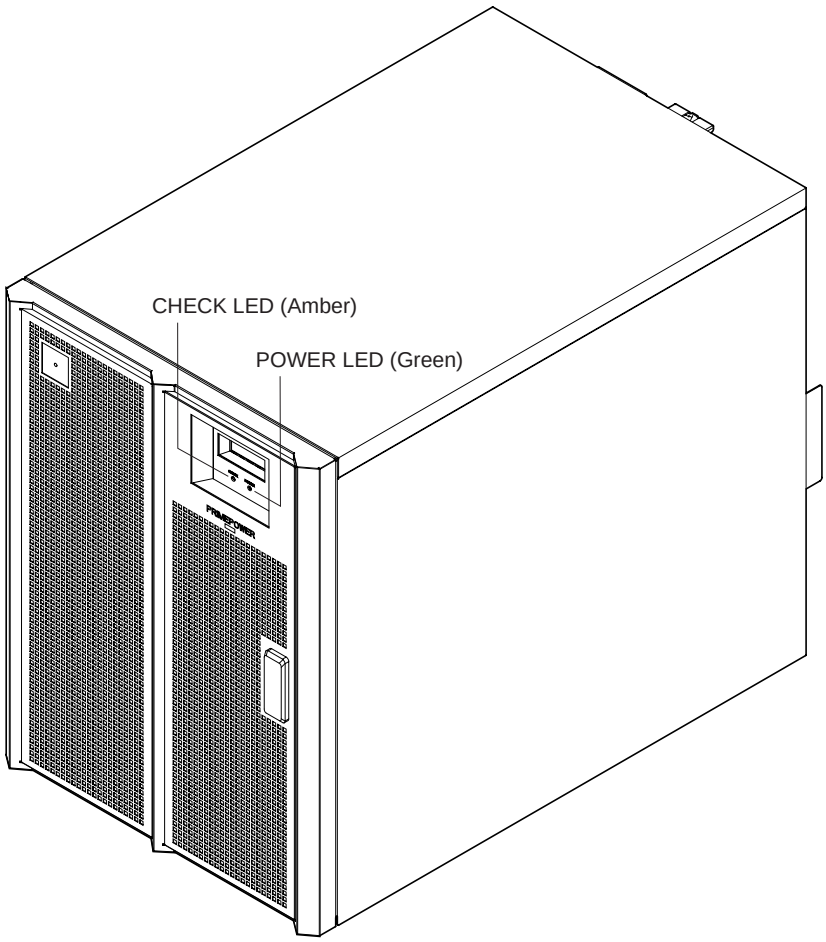


Figure 7.1 PRIMEPOWER600 Pedestal Server

7.2 Names and Functions of Parts

This section describes the names and functions of parts on the front, control panel and rear of the PRIMEPOWER600 Pedestal Server.

7.2.1 Front side

The names and functions of parts on the front of the PRIMEPOWER600 Pedestal Server are as follows.

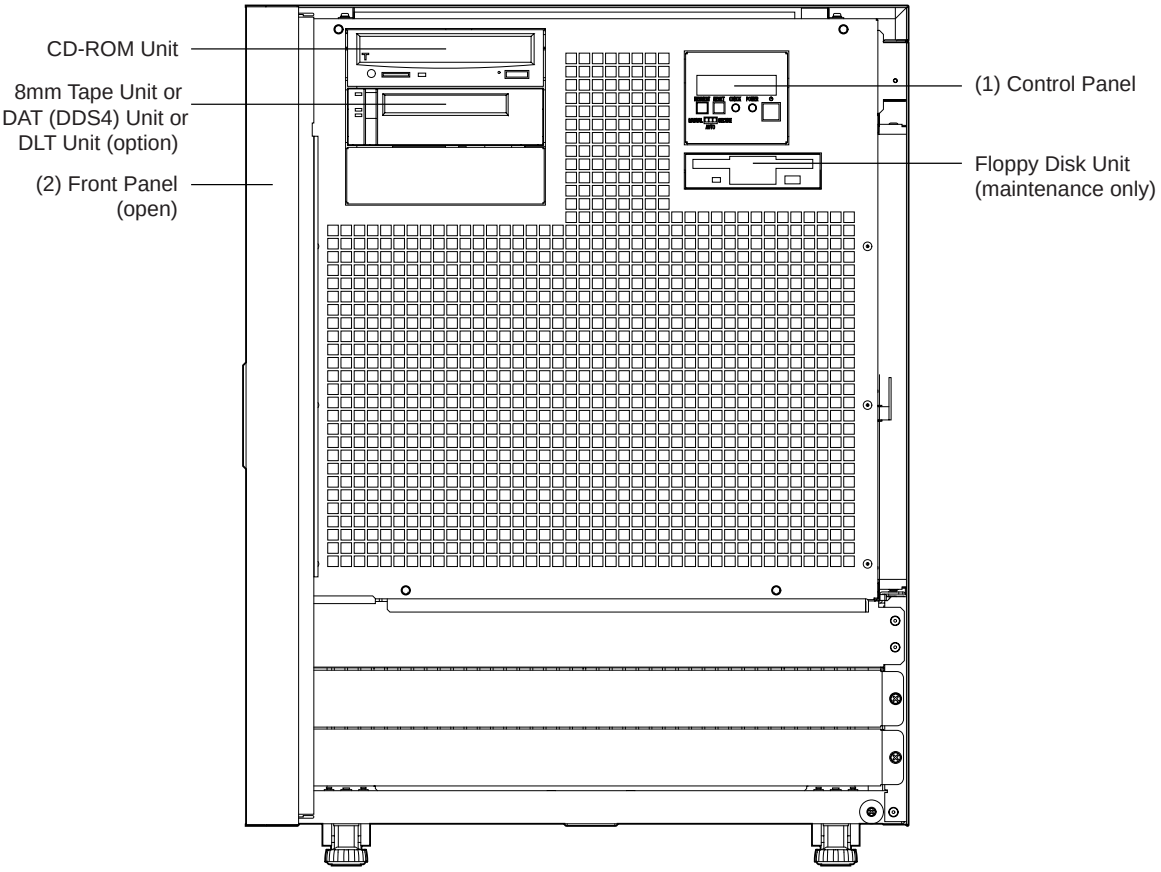


Figure 7.2 Front of PRIMEPOWER600 Pedestal Server

(1) Control panel

Contains various switches and indicator LEDs. See "7.2.2 Control Panel" for details.

(2) Front cover

The panel cover can be opened to its right after being unlocked.

The LCD panel and the POWER and CHECK LEDs can be checked with the cover closed.

7.2.2 Control panel

The PRIMEPOWER600 Pedestal Server is provided with the control panel shown in Figure 7.3 .

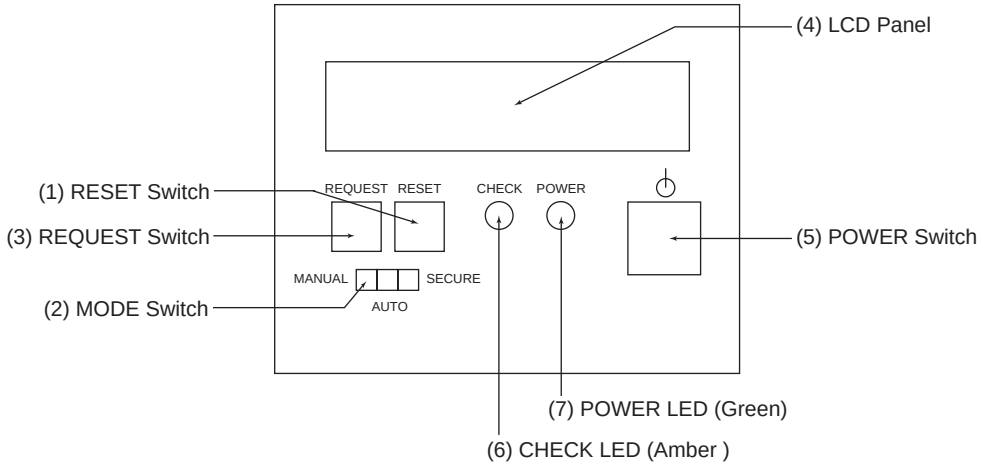


Figure 7.3 Control Panel

Note: To prevent erroneous operation, all push-button switches on the control panel are designed not to function unless held down for at least 0.3 seconds.

(1) RESET switch (push button)

⚠CAUTION

Data Destruction

Pressing the RESET switch while the system is running may cause data to be lost.

The RESET switch is used to reset the system to its initial state and is enabled or disabled by the MODE switch described in "(2) MODE switch".

(2) MODE switch (3-position slider)

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

The MODE switch has three settings and is used to specify the run mode at power on or system reboot, and to whether the POWER, RESET and REQUEST switches are "enabled" or "disabled".

Table 7.1 MODE Switch Settings

MODE switch	POWER switch	RESET switch	REQUEST switch	Operation mode
MANUAL	Enabled	Enabled	Enabled	The bootup sequence stops at an ok prompt after initial diagnostics are completed. Use this mode to enter commands and make settings from the ok prompt when performing maintenance on the server unit.
AUTO	Enabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed.
SECURE	Disabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed. The TTY terminal "break" and keyboard "STOP+A" commands are disabled while Solaris is operating.

(3) REQUEST switch (push button)

⚠CAUTION

Data Destruction

Pressing the REQUEST switch while the system is running may cause data to be lost.

The REQUEST switch is for outputting a memory dump when an error has occurred in the system. Only service engineers should operate the REQUEST switch.

(4) LCD panel

The 16-digit x 2-row LCD panel displays the status of initial diagnostics performed when the power is turned on.

It also displays error messages when a hardware error has been detected. For details on error messages that maybe displayed, see "13 Troubleshooting".

A LCD panel error message is cleared by one of the following:

- When the problem has been fixed
- When the power is next turned on
- When the main AC power is cut off.

Some displayed error messages may be cleared when the RESET switch is pressed.

(5) POWER switch (push button)

The POWER switch instructs the system to return the power on and off.

Power on and off of expansion units (such as the Expansion Disk Cabinet) is interlocked with the powering on and off of the PRIMEPOWER600 Pedestal Server.

Operation of the POWER switch varies according to the MODE switch and scftool (software contained in the "Enhanced Support Facility") settings. For details, see "(2) MODE switch" and the "Enhanced Support Facility User’s Guide."

(6) CHECK LED

IMPORTANT

When the PRIMEPOWER600 Pedestal Server detects an error in the power line or abnormal temperatures, the CHECK LED blinks and the power is automatically turned off to prevent unit damage and ensure safety.

The CHECK LED blinks or lights up when the PRIMEPOWER600 Pedestal Server detects an error.

When the power is turned on, the CHECK LED lights up and then goes out. This is not an error. If the CHECK LED stays lit and does not go out at power on, this indicates an error.

When an error occurs, note down the details displayed on the LCD panel, and contact a service engineer.

(7) POWER LED

The POWER LED indicates the power state of the system. This LED lights up when the power is on, and goes out when the power is turned off.

7.2.3 Rear side

The names and functions of parts on the rear of the PRIMEPOWER600 Pedestal Server are as follows.

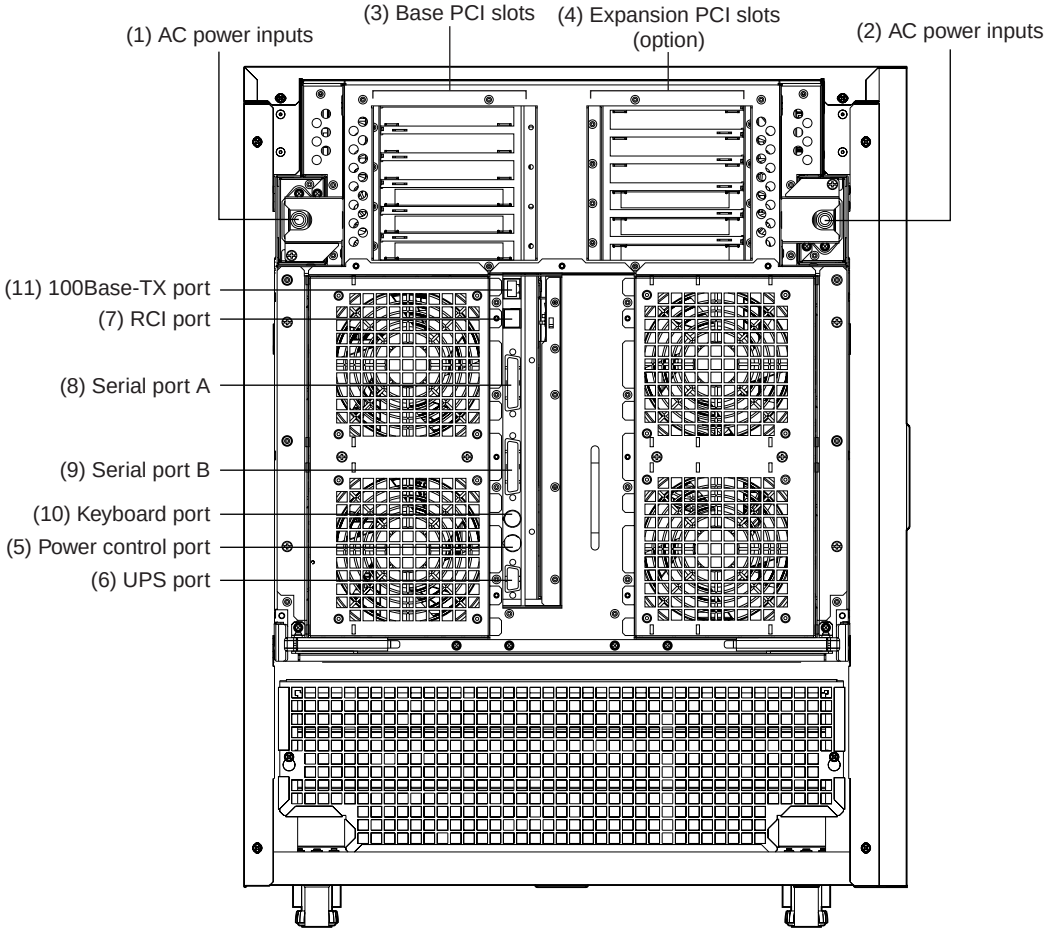


Figure 7.4 Rear of PRIMEPOWER600 Pedestal Server

(1), (2) AC power inputs

Connect the power cables to these points. Both AC power cords must be plugged into the same power grid / circuit.

(3) Base PCI slots, (4) Expansion PCI slots (option)

- PCI slots conform to the PCI local bus specification (Rev. 2.1).
- 64-bit bus, 33MHz (5.0 V) and 33/66MHz (3.3V) are supported.
- All RCI support long cards (31.19 cm, 12.3 in.).

(5) Power control port (label : PC)

8-pin DIN for power control

(6) UPS port (label : UPS)

Dsub-9 pin for connecting the signal cable of an uninterruptible power supply

(7) RCI port (label : RCI)

RJ11 connector for connecting the RCI cable and terminator (provided with the server unit)

(8), (9) Serial ports (label : SERIAL A/B)

Dsub-25 pin ports for connecting a console terminal when performing maintenance on the server unit using the RS-232C interface

(10) Keyboard port (label : KB)

8-pin DIN port for connecting a keyboard cable

(11) 100Base-TX port (label : LAN)

RJ45 connector automatically recognizes at 10Mbps/100Mbps

7.3 Preparations for Use

This section describes the following:

- Installation notes and specifications
- Connecting the console
- Turning power on and off
- Installing the Enhanced Support Facility package
- Enabling/disabling the break signal
- LAN expansion note

7.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the PRIMEPOWER600 Pedestal Server may be damaged. Be sure to follow these notes.

- Do not block the ventilation holes.
- Do not install the PRIMEPOWER600 Pedestal Server where it will be exposed to sunlight or sources of heat.
- Do not install the PRIMEPOWER600 Pedestal Server in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the PRIMEPOWER600 Pedestal Server isolated from vibration. Install the PRIMEPOWER600 Pedestal Server on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the PRIMEPOWER600 Pedestal Server may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the PRIMEPOWER600 Pedestal Server. Do not use the top of the PRIMEPOWER600 Pedestal Server as a workspace.

- To prevent condensation in the PRIMEPOWER600 Pedestal Server, do not raise the ambient room temperature rapidly in winter.

  Use the PRIMEPOWER600 Pedestal Server only after it has warmed up sufficiently.
- Do not install the PRIMEPOWER600 Pedestal Server near EM noise generating devices such as photocopiers, air conditioners, or welders.
- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the PRIMEPOWER600 Pedestal Server to malfunction.
- When moving the PRIMEPOWER600 Pedestal Server, do not pull on the front cover. Otherwise, the Server may be damaged.

⚠CAUTION

Connect the ground before connecting any of the power supply lines. If all of the power cables are connected to a single power strip, high leakage current exceeding the stipulated value may leak through to the earth lead of the power strip.

If the power strip is not directly connected to the main distribution panel, use a power strip with an industrial plug.

7.3.2 Installation specifications

Table 7.2 and Table 7.3 show the installation specifications for the PRIMEPOWER600 Pedestal Server.

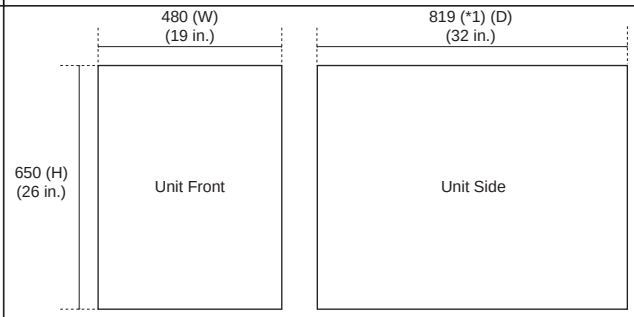
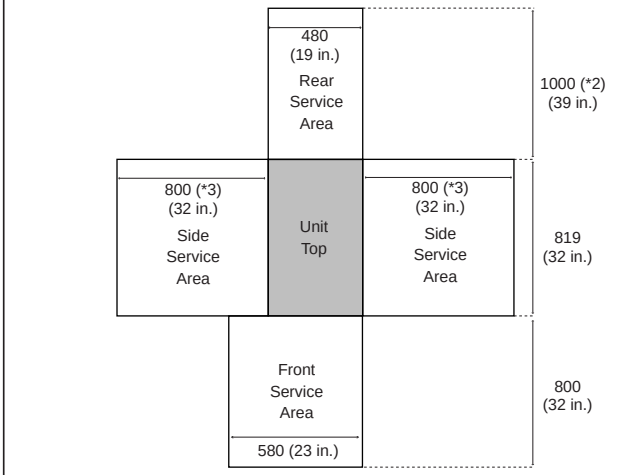
Table 7.2 Installation Specifications of the PRIMEPOWER600 Pedestal Server (1/2)

Item		Specification	
Weight		130 kg (286.98 lb.) (max.)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100V (±10%)	Single phase AC200V (±10%)
Max. Current		19.0 A	9.5 A
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*1)	
	Non-operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-operating	0.4 G	
Noise		50 db(A) (*2)	
Form Factor		Pedestal	

*1: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2: The indicated noise is the mean value of measurements obtained in a low-noise anechoic chamber. The actual noise measured at the installation site may be greater than the indicated value due to background noise and echoes.

Table 7.3 Installation Specifications of the PRIMEPOWER600 Pedestal Server (2/2)

Item	Specification
Unit Dimensions (units : mm)	
Service Areas (units : mm)	

*1: Not including any projections.

*2: If it is possible to move the Server Unit so that 800 mm (32-inch) or more space is available behind the unit when maintenance is performed, then 200mm (8-inch) of space is adequate is normal use. However, if optical cables are used, at least 300mm (12- inch) of space will be needed between the rear of the Unit and the wall.

*3: If it is possible to move the server unit so that the 800mm (32-inch) or more space is available beside the Unit when maintenance is performed, then no space is required in normal use.

7.3.3 Connecting the console

A device such as a personal computer must be connected to the serial port to act as the console for a PRIMEPOWER600 Pedestal Server to which a display or keyboard is not connected. Pay attention to the following when connecting the console to the serial port on the PRIMEPOWER600 Pedestal Server.

Connect the serial cable:

Connect to serial A port.

Communication settings on the terminal:

Set to 8 bits, 1 stop bit, parity OFF, and 9600 baud.

7.3.4 Turning the power on

The following describes how to turn the power on.

⚠CAUTION

Data Destruction

Do not turn the console terminal (device connected to the serial port) on after turning the PRIMEPOWER Server on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

- If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.
- When the PRIMEPOWER Server is turned on, a self-diagnostics routine automatically verifies whether or not hardware errors are occurring. If this routine detects any hardware errors, system power is automatically turned off and on again (if the MODE switch on the control panel is set to AUTO or SECURE). This power off/on retry sequence is performed twice. In both retries, the routine checks for errors. If an error occurs in both cases, the routine judges that the system cannot be booted up and stops the system bootup sequence.

Procedure

1 Turn the AC main line power on.

2 Turn the power switches of the console terminal and peripheral devices on.

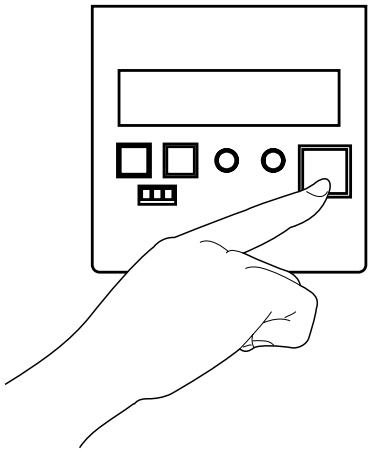


Figure 7.5 Turning the power on

3 Press the POWER switch on the control panel of the PRIMEPOWER600 Pedestal Server.

The POWER LEDs of the PRIMEPOWER Server and any peripheral devices connected via the RCI port should now light up.

Note: Operation of the POWER switch is disabled when the MODE switch is set to SECURE.

A keyboard power-on function is not supported.

7.3.5 Turning the power off

The following describes how to turn the power off.

⚠CAUTION

Data Destruction

Before turning the power off, check the answer to each of the following points is "No", or data may be lost:

- Are there any currently executing programs?
- Are there any current users?
- Are floppy disks or tape cartridges still inserted in their drives?

Backup files as necessary before turning the power off.

Also, do not turn off the console while the PRIMEPOWER Server is turned on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation, potentially causing data to be lost.

IMPORTANT

If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.

Procedure

1. Press the POWER switch on the control panel of the PRIMEPOWER600 Pedestal Server.
2. Press the POWER switch again within five seconds (scftool default interval).
   This starts the system shutdown sequence. The power turns off after the system shuts down.
   For details on scftool, refer to the "User's Guide" included with the "Enhanced Support Facility."

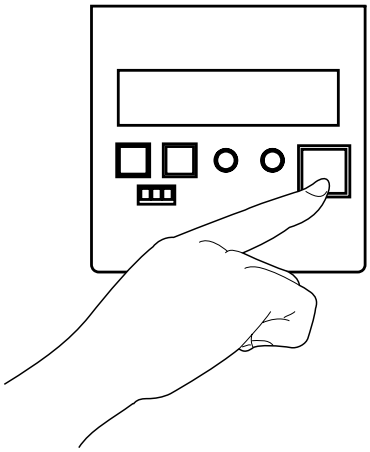


Figure 7.6 Turning the power off

3 Turn the power switches of peripheral devices off after the PRIMEPOWER600 Pedestal Server power has turned off.

7.3.6 Installing the Enhanced Support Facility package

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

With the PRIMEPOWER servers, be sure to install all of the programs provided with the "Enhanced Support Facility" to ensure the high reliability functions or the service processor. For details, refer to the "User’s Guide" included with the "Enhanced Support Facility."

7.3.7 How to enable/disable the break signal

⚠CAUTION

Data Destruction

If improper commands are used at the ok prompt, data may be lost. If you need to use any command except those shown in this manual, you should fully understand the function and usage of the command before using it.

Data is sometimes lost as the bootup sequence shifts to display of the ok prompt during system operation in response to a break signal from the console terminal connected to the serial port or the STOP+A command from the keyboard.

To prevent this kind of response to a break signal arriving from the serial port or the STOP+A command from the keyboard, make the following settings using the set-fw-options command shown below with the ok prompt displayed on screen, and then set the MODE switch on the control panel to the SECURE mode.

How to disable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting.
The factory default is that nothing is set.

```
ok  print-fw-options
fw-options =
```

2 Use the set-fw-options command to set the value (no-break) for disabling the break signal and STOP command.

```
ok  set-fw-options no-break
fw-options = no-break
```

3 Use the print-fw-options command to make sure that no-break is correctly set.

```
ok  print-fw-options
fw-options = no-break
```

How to enable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting values. If the no-break shown below is not displayed, the break signal and STOP+A command are already enabled.

```
ok  print-fw-options
fw-options = no-break
```

2 Use the clear-fw-options command to cancel the no-break setting.

```
ok  clear-fw-options no-break
fw-options =
```

3 Use the print-fw-options command to make sure that nothing is set.

```
ok  print-fw-options
fw-options =
```

7.3.8 LAN expansion note

When LAN ports have seen added with PCI cards, and each LAN port given its own MAC address, these should be enabled from the ok prompt, as follows:

```
ok  setenv  local-mac-address?  true
```

7.4 Expanding the Server Unit

⚠CAUTION

The following operations should be performed by a service engineer, and not by the user. Otherwise, the product may malfunction.

- Mounting/removal of optional internal units

The following optional items can be added to the PRIMEPOWER600 Pedestal Server:

- Power supply units
- CPU modules
- Memory modules
- Hard disk drives
- PCI cards

Systemboard mounting locations are as follows:

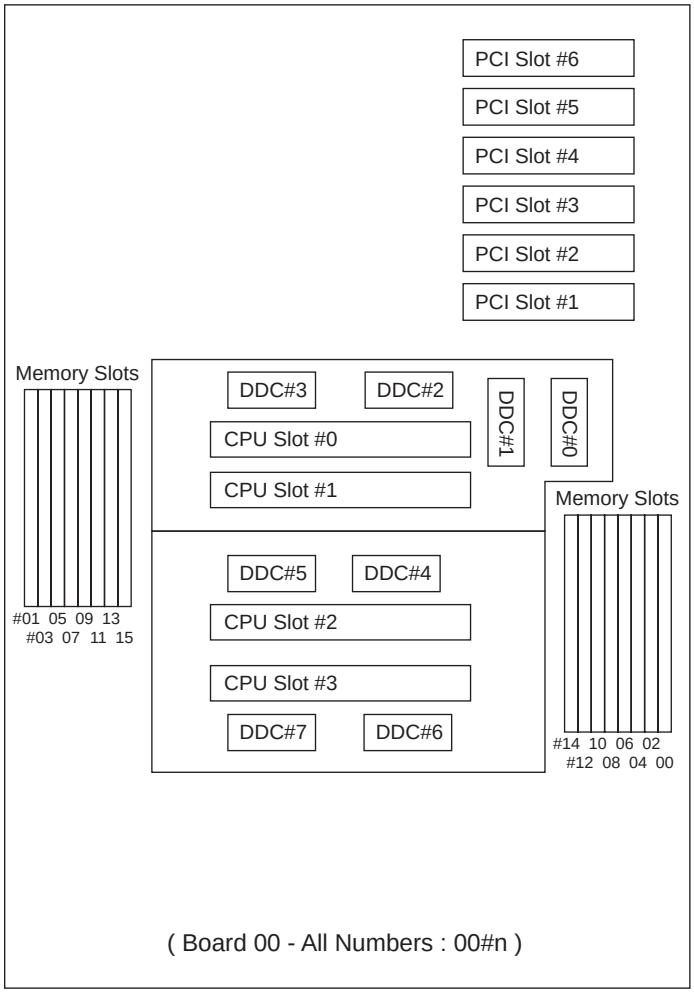


Figure 7.7 PRIMEPOWER600 Pedestal Server Systemboard

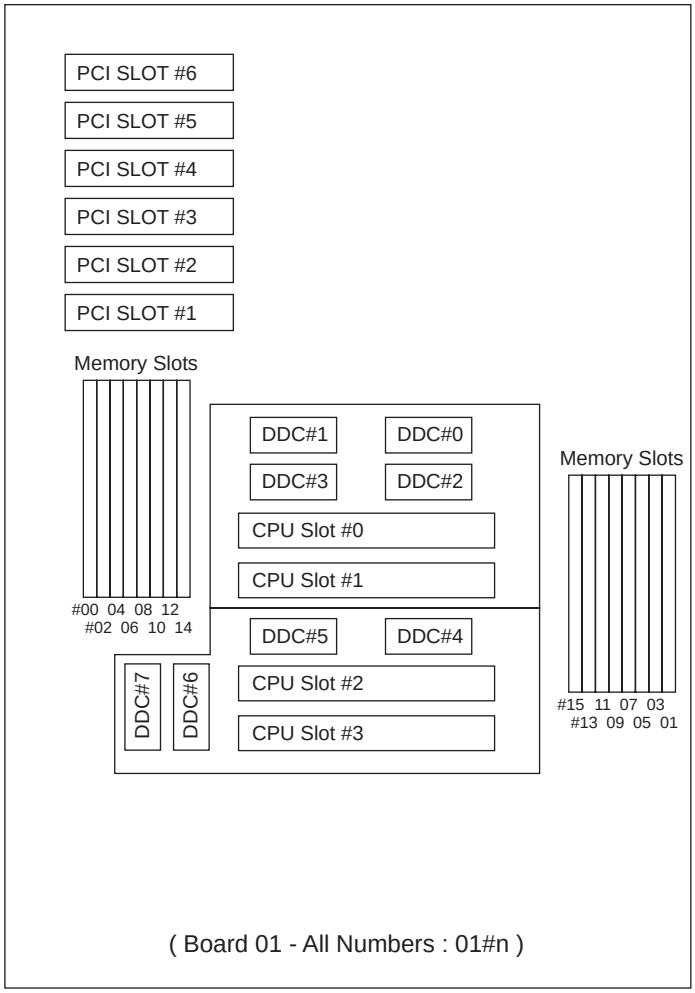


Figure 7.8 PRIMEPOWER600 Pedestal Server Expansion Systemboard (Option)

7.4.1 Adding power supply units

IMPORTANT

Adding an optional redundant power supply unit allows hot-swapping of the power supply units.

⚠CAUTION

Unit Damage

Power supply units may be damaged if hot-swapping of the power supply units is not performed correctly. Contact the service engineer if a power supply unit must be hot-swapped.

Power supply units (FEP) installed on the PRIMEPOWER600 Pedestal Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping. For details on how to swap power supply units, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

7.4.2 Adding CPU modules

A total of eight CPU module slots are provided on the PRIMEPOWER600 Pedestal Server Systemboard.

IMPORTANT

The Expansion Systemboard must be first installed before the fifth and further CPUs can be added.

When adding CPU modules the following restrictions apply:

- Only SPARC64 GP processors can be used.
- To ensure they all operate at the same clock speed, have the same cache size and use the same CPU stepping, the model name must be identical for all CPUs.
- CPU modules must be added according to Table 7.4 .

IMPORTANT

Operation for configurations other than those shown in Table 7.4 cannot be guaranteed.

Table 7.4 Allowed CPU Module Configurations

No. of CPUs	CPU slot #								No. of DDCs	DDCs to be added (incremental)
	00 #0	00 #1	00 #2	00 #3	01 #0	01 #1	01 #2	01 #3		
1	O	-	-	-	-	-	-	-	2	DDC 00#0, DDC 00#1
2	O	-	O	-	-	-	-	-	4	DDC 00#4, DDC 00#5
3	O	O	O	-	-	-	-	-	6	DDC 00#2, DDC 00#3
4	O	O	O	O	-	-	-	-	8	DDC 00#6, DDC 00#7
5	O	O	O	O	O	-	-	-	10	DDC 01#0, DDC 01#1
6	O	O	O	O	O	-	O	-	12	DDC 01#4, DDC 01#5
7	O	O	O	O	O	O	O	-	14	DDC 01#2, DDC 01#3
8	O	O	O	O	O	O	O	O	16	DDC 01#6, DDC 01#7

7.4.3 Adding memory modules

A total of 32 memory module slots are provided on the PRIMEPOWER600 Pedestal Server Systemboard.

IMPORTANT

The Expansion Systemboard must be first installed before the seventeenth and further memory modules can be added.

When adding memory modules the following restrictions apply.

IMPORTANT

Operation for configuration other than those described below cannot be guaranteed.

- Each sequential group of 4 memory slots (#0-3, #4-7, #8-11, #12-15) must be either left empty or completely filled with 4 identical memory modules.

7.4.4 Adding hard disk drives

Disk drive configurations

Up to six hot-swappable UltraSCSI disk drives can be added to the PRIMEPOWER600 Pedestal Server. Each of the disk drive bays is provided with an ACTIVE LED and a FAULT LED.

The ACTIVE LED lights up (green) when a hard disk drive is operating (reading or writing). The FAULT LED lights up according to the swapping procedure when hot-swapping a hard disk drive.

Hot-swapping hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the PRIMEPOWER600 Pedestal Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE and FAULT LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

7.4.5 Adding PCI cards

IMPORTANT

The Expansion Systemboard must be first installed before the seventh and further PCI slots can be added.

There are three types of PCI card: a PCI card designed to operate in 3.3V slots, a PCI card designed to operate in 5V slots, and a PCI (universal) card design to operate in both 3.3V and 5V slots. Though most PCI cards operate at a 33MHz clock, some cards operate at a 66MHz clock.

Refer to Table 7.5 and Figure 7.9 below for details of the PCI slot positions when installing PCI cards.

Table 7.5 PCI Slot Specifications

	PCI Slot number	PCI Bus	Slot / Card Width (bits)	PCI Clock Rate (MHz)	Card Input Voltage	long / short
Base PCI Slots	00 # 6	D	64 / 32, 64	33	5V or Universal	long
	00 # 5	C	64 / 32, 64	33	5V or Universal	long
	00 # 4	C	64 / 32, 64	33	5V or Universal	long
	00 # 3	C	64 / 32, 64	33	5V or Universal	long
	00 # 2	B	64 / 32, 64	33 / 66	3.3V or Universal	long
	00 # 1	A	64 / 32, 64	33 / 66	3.3V or Universal	long
Expansion PCI Slots	01 # 6	H	64 / 32, 64	33	5V or Universal	long
	01 # 5	G	64 / 32, 64	33	5V or Universal	long
	01 # 4	G	64 / 32, 64	33	5V or Universal	long
	01 # 3	G	64 / 32, 64	33	5V or Universal	long
	01 # 2	F	64 / 32, 64	33 / 66	3.3V or Universal	long
	01 # 1	E	64 / 32, 64	33 / 66	3.3V or Universal	long

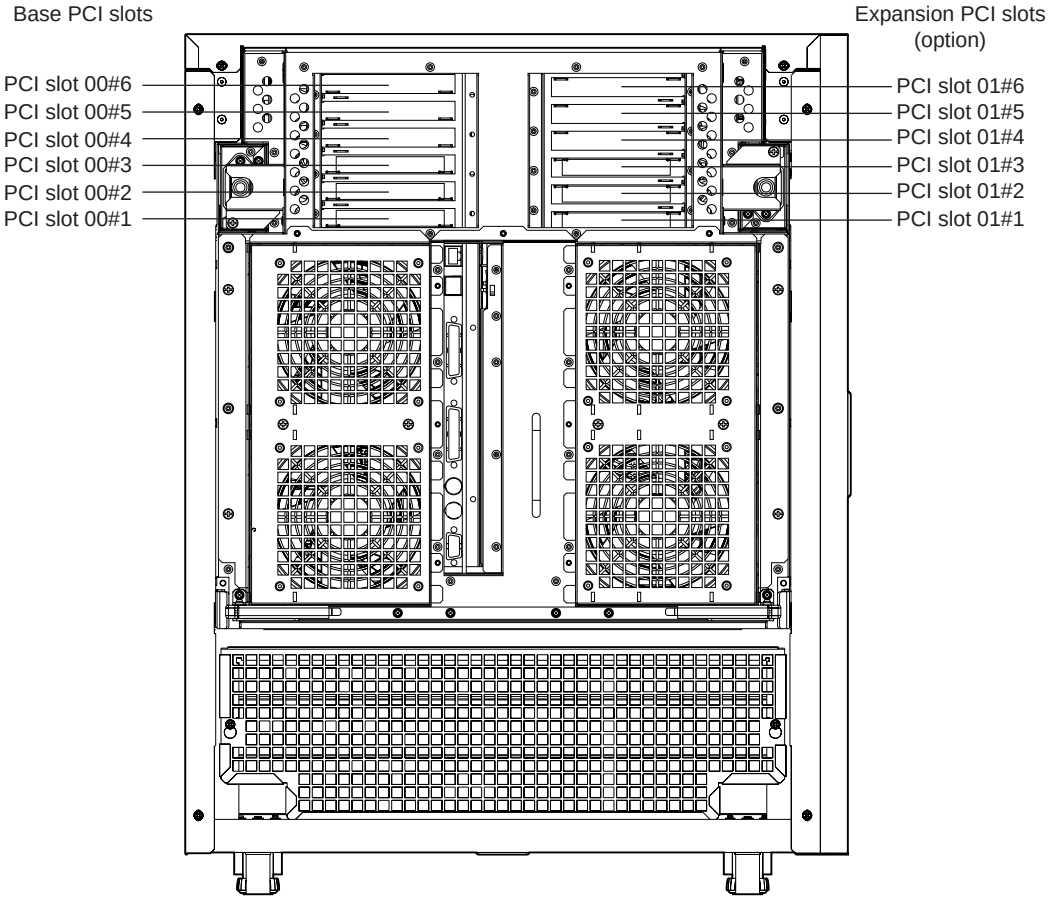


Figure 7.9 Rear of PRIMEPOWER600 Pedestal Server showing position of PCI slots

8

PRIMEPOWER600 Rackmount (10U) Server

This chapter gives an overview of the PRIMEPOWER600 Rackmount (10U) Server, names and functions of parts, preparations for use, and how to expand the server unit.

CONTENTS

8.1 Overview 140
8.2 Names and Functions of Parts 141
8.3 Preparations for Use 146
8.4 Expanding the Server Unit 155

8.1 Overview

The following describes the key features and appearance of the PRIMEPOWER600 Rackmount (10U) Server.

Key Features

- The server unit can be configured with up to eight CPUs.
- Up to 32 gigabytes of memory can be mounted.
- Up to 12 PCI slots (4 x 33/66MHz + 8 x 33MHz) are provided.
- Up to six UltraSCSI disk drives can be built in.
- One tape unit (DDS4 DAT, 8mm or DLT) can be installed.
- A CD-ROM drive is provided as standard.
- One 100Base-TX port, two serial ports (RS-232C) and one keyboard/mouse port are provided as standard.
- Redundant fan and N+1 redundant power supply configurations are supported.

Appearance

The following illustration shows the appearance of the PRIMEPOWER600 Rackmount (10U) Server.

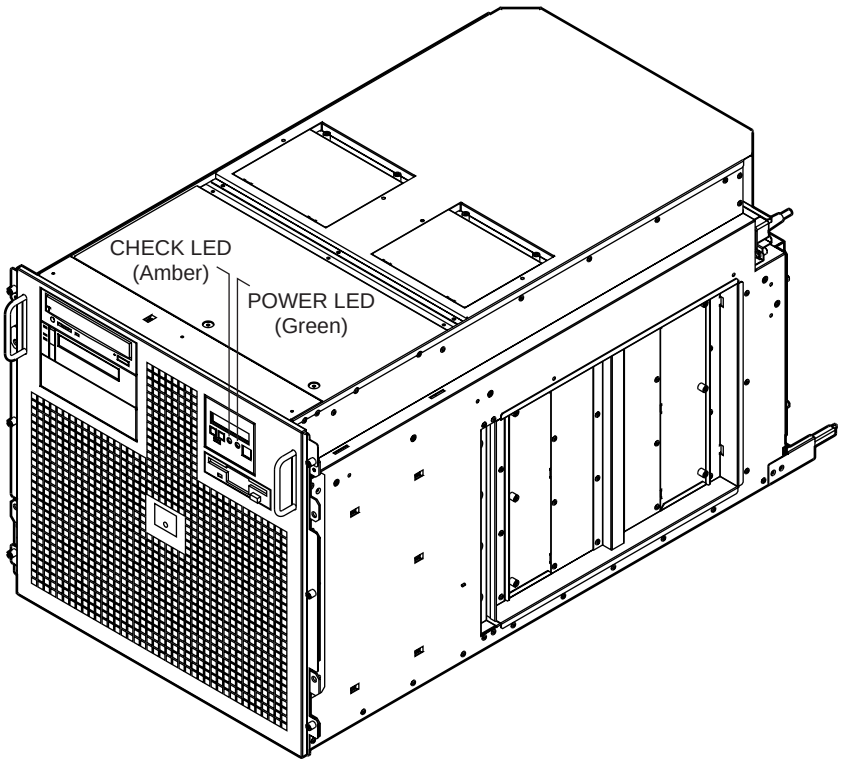


Figure 8.1 PRIMEPOWER600 Rackmount (10U) Server

8.2 Names and Functions of Parts

This section describes the names and functions of parts on the front, control panel and rear of the PRIMEPOWER600 Rackmount (10U) Server.

8.2.1 Front side

The names and functions of parts on the front of the PRIMEPOWER600 Rackmount (10U) Server are as follows.

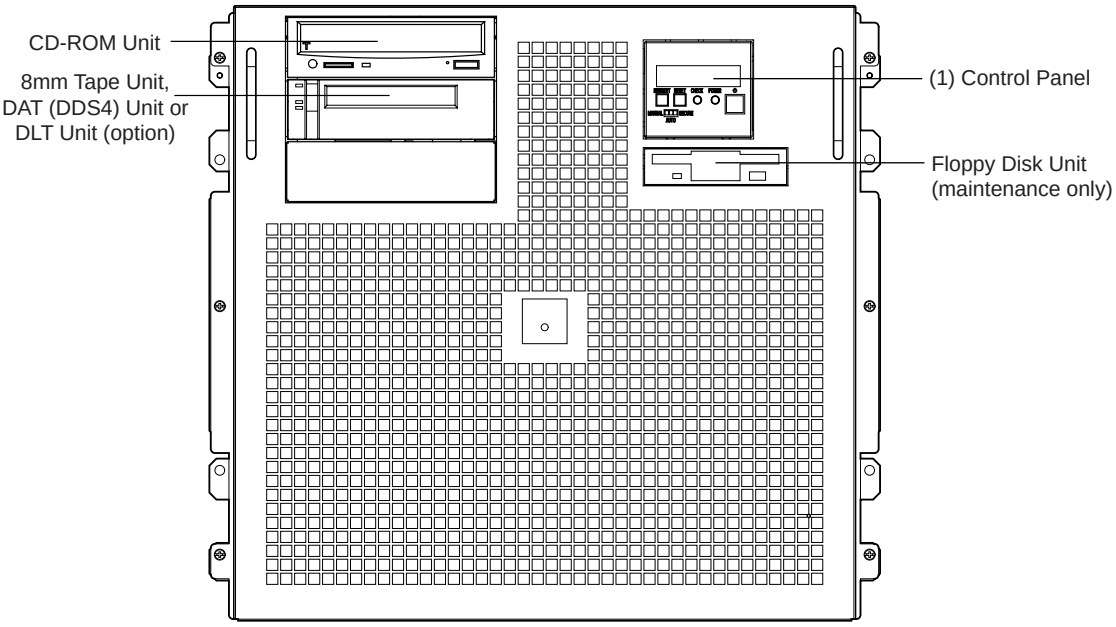


Figure 8.2 Front of PRIMEPOWER600 Rackmount (10U) Server

(1) Control panel

Contains various switches and indicator LEDs. See "8.2.2 Control Panel" for details.

8.2.2 Control panel

The PRIMEPOWER600 Rackmount (10U) is provided with the control panel shown in Figure 8.3 .

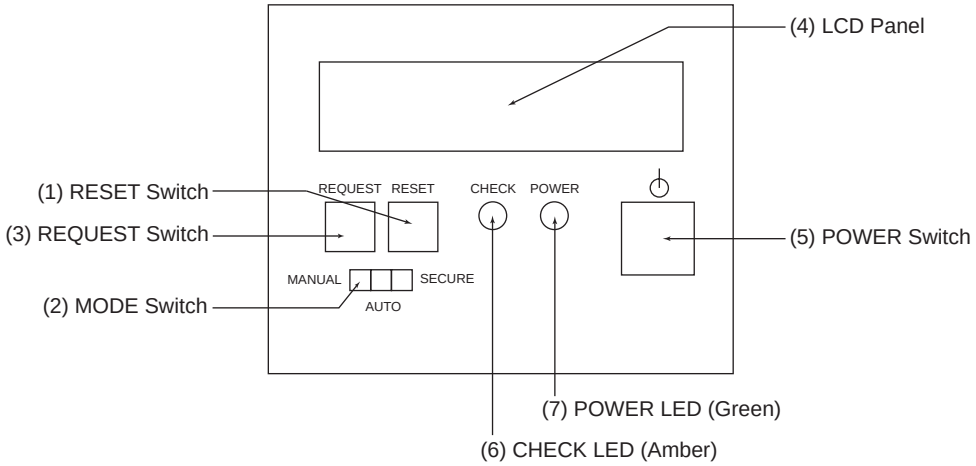


Figure 8.3 Control panel

Note: To prevent erroneous operation, all push-button switches on the control panel are designed not to function unless held down for at least 0.3 seconds.

(1) RESET switch (push button)

⚠CAUTION

Data Destruction

Pressing the RESET switch while the system is running may cause data to be lost.

The RESET switch is used to reset the system to its initial state and is enabled or disabled by the MODE switch described in "(2) MODE switch".

(2) MODE switch (3-position slider)

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, a front panel-miss operation or hardware error may cause the system to shutdown or data to be lost.

The MODE switch has three settings and is used to specify the run mode at power on or system reboot, and to whether the POWER, RESET and REQUEST switches are "enabled" or "disabled".

Table 8.1 MODE Switch Settings

MODE switch	POWER switch	RESET switch	REQUEST switch	Operation mode
MANUAL	Enabled	Enabled	Enabled	The bootup sequence stops at an ok prompt after initial diagnostics are completed. Use this mode to enter commands and make settings from the ok prompt when performing maintenance on the server unit.
AUTO	Enabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed.
SECURE	Disabled	Disabled	Disabled	The OS is automatically booted after initial diagnostics are completed. The TTY terminal "break" and keyboard "STOP+A" commands are disabled while Solaris is operating.

(3) REQUEST switch (push button)

⚠CAUTION

Data Destruction

Pressing the REQUEST switch while the system is running may cause data to be lost.

The REQUEST switch is for outputting a memory dump when an error has occurred in the system. Only service engineers should operate the REQUEST switch.

(4) LCD panel

The 16-digit x 2-row LCD panel displays the status of initial diagnostics performed when the power is turned on.

It also displays error messages when a hardware error has been detected. For details on error messages that maybe displayed, see "13 Troubleshooting".

A LCD panel error message is cleared by one of the following:

- When trouble has been fixed
- When the power is next turned on
- When the main AC power is cut off.

Some displayed error messages may be cleared when the RESET switch is pressed.

(5) POWER switch (push button)

The POWER switch instructs the system to return the power on and off.

Power on and off of expansion units (such as the Expansion Disk Cabinet) Unit is interlocked with the powering on and off of the PRIMEPOWER600 Rackmount (10U) Server.

Operation of the POWER switch varies according to the MODE switch and scftool (software contained in the "Enhanced Support Facility") settings. For details, see "(2) MODE switch" and the "Enhanced Support Facility User’s Guide."

(6) CHECK LED

IMPORTANT

When the PRIMEPOWER600 Rackmount (10U) Server detects an error in the power line or abnormal temperatures, the CHECK LED blinks and the power is automatically turned off to prevent unit damage and ensure safety.

The CHECK LED blinks or lights up when the PRIMEPOWER600 Rack mount (10U) Server detects an error.

When the power is turned on, the CHECK LED lights up and then goes out. This is not an error. If the CHECK LED stays lit and does not go out at power on, this indicates an error.

When an error occurs, note down the details displayed on the LCD panel, and contact a service engineer.

(7) POWER LED

The POWER LED indicates the power state of the system. This LED lights up when the power is on, and goes out when the power is turned off.

8.2.3 Rear side

The names and functions of parts on the rear of the PRIMEPOWER600 Rackmount (10U) Server are as follows.

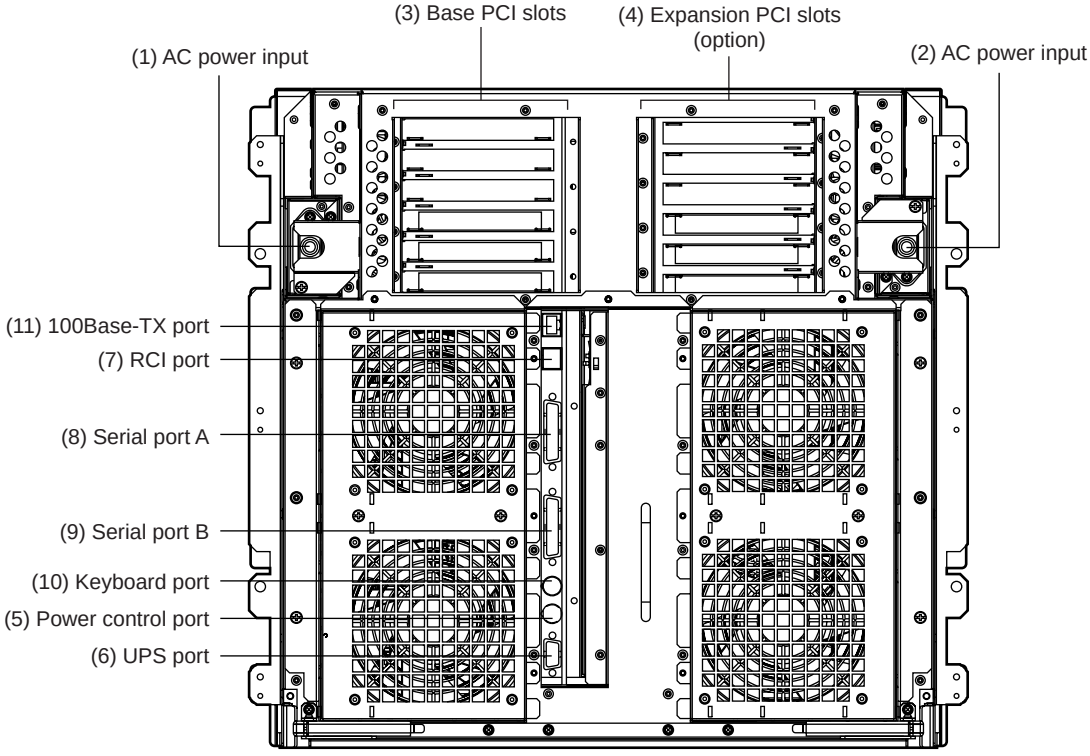


Figure 8.4 Rear of PRIMEPOWER600 Rackmount (10U) Server

(1), (2) AC power inputs

Connect the power cables to these points. Both AC power cords must be plugged into the same power grid / circuit.

(3) Base PCI slots, (4) Expansion PCI slots (option)

- PCI slots conform to the PCI local bus specification (Rev. 2.1).
- 64-bit bus, 33MHz (5.0 V) and 33/66MHz (3.3V), are supported.
- All RCI support long cards (31.19 cm, 12.3 in.).

(5) Power control port (label : PC)

8-pin DIN for power control

(6) UPS port (label : UPS)

Dsub-9 pin for connecting the signal cable of an uninterruptible power supply

(7) RCI port (label : RCI)

RJ11 connector for connecting the RCI cable and terminator (provided with the server unit)

(8), (9) Serial ports (label : SERIAL A/B)

Dsub-25 pin ports for connecting a console terminal when performing maintenance on the server unit using the RS-232C interface

(10) Keyboard port (label : KB)

8-pin DIN port for connecting a keyboard cable

(11) 100Base-TX port (label : LAN)

RJ45 connector automatically recognizes at 10Mbps/100Mbps

8.3 Preparations for Use

This section describes the following:

- Installation notes and specifications
- Connecting the console
- Turning power on and off
- Installing the Enhanced Support Facility package
- Enabling/disabling the break signal
- LAN expansion note

8.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the PRIMEPOWER600 Rackmount (10U) Server may be damaged. Be sure to follow these notes.

Rack installation notes

The following instructions are intended to provide product safety requirements to be addressed when the end-use product manufacturer installs this product in their equipment.

- As the PRIMEPOWER600 Rackmount (10U) Server is installed in a closed or multi-unit rack assembly, the ambient operating temperature inside of the rack environment may be greater than the room temperature. So, consideration should be given to installing the PRIMEPOWER600 Rackmount (10U) Server in an environment compatible with the manufacturer's maximum rated ambient temperature.
  - Consideration for adjustment of air conditions like air circulation should be given to prevent the internal rack ambient temperature from exceeding the maximum operating temperature of this unit.
  - Maximum internal operating temperature of this unit: 35 deg. C (95 deg. F)
- Installation of the PRIMEPOWER600 Rackmount (10U) Server should be such that the amount of air flow required for safe operation of the PRIMEPOWER600 Rackmount (10U) Server is not compromised.
  - The PRIMEPOWER600 Rackmount (10U) Server has ventilation openings at the front and rear faces of the unit.
  - To prevent overheating, do not cover or close these ventilation openings.
- Mounting of the PRIMEPOWER600 Rackmount (10U) Server in the rack should be such that a hazardous condition does not result from uneven mechanical loading. To maintain the stability of the entire rack, please fix the rack to the wall or floor by suitable means.

  - Be careful of injuries during installation of the PRIMEPOWER600 Rackmount (10U) Server into the rack.
  - Do not install the PRIMEPOWER600 Rackmount (10U) Server into a rack if the server unit may make the entire rack unstable.
  - Maximum configured weight of this unit: 108 kg (238.41 lb.)

- If the PRIMEPOWER600 Rackmount (10U) Server is supplied with power from a power strip or service outlet of other units, it may overload the power supply cord or the power strip of other units.
  - Confirm that the current rating of the power strip or service outlet exceeds the combined ratings of all equipment it is supplying.
  - Electrical ratings of this unit: 100 to 240VAC, 19.0 to 9.5A, 50/60Hz, single-phase
- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to non-direct-to-mains connections (e.g. via power strips, etc.).

⚠CAUTION

Connect the ground before connecting any of the power supply lines. If all of the power cables are connected to a single power strip, high leakage current exceeding the stipulated value may leak through to the earth lead of the power strip.

If the power strip is not directly connected to the main distribution panel, use a power strip with an industrial plug.

General installation notes

- Do not block the ventilation holes.
- Do not install the PRIMEPOWER600 Rackmount (10U) Server where it will be exposed to sunlight or sources of heat.
- Do not install the PRIMEPOWER600 Rackmount (10U) Server in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the PRIMEPOWER600 Rackmount (10U) Server isolated from vibration. Install the PRIMEPOWER600 Rackmount (10U) Server on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the PRIMEPOWER600 Rackmount (10U) Server may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the PRIMEPOWER600 Rackmount (10U) Server. Do not use the top of the PRIMEPOWER600 Rackmount (10U) Server as a workspace.
- To prevent condensation on the PRIMEPOWER600 Rackmount (10U) Server, do not raise the ambient room temperature rapidly in winter.

  Use the PRIMEPOWER600 Rackmount (10U) Server only after it has warmed up sufficiently.
- Do not install the PRIMEPOWER600 Rackmount (10U) Server near EM noise generating devices such as photocopiers, air conditioners, or welders.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the PRIMEPOWER600 Rackmount (10U) Server to malfunction.
- When moving the PRIMEPOWER600 Rackmount (10U) Server, do not pull on the front cover. Otherwise, the Server may be damaged.

8.3.2 Installation specifications

Table 8.2 and Table 8.3 show the installation specifications for the PRIMEPOWER600 Rackmount (10U) Server.

Table 8.2 Installation Specifications of the PRIMEPOWER600 Rackmount (10U) Server (1/2)

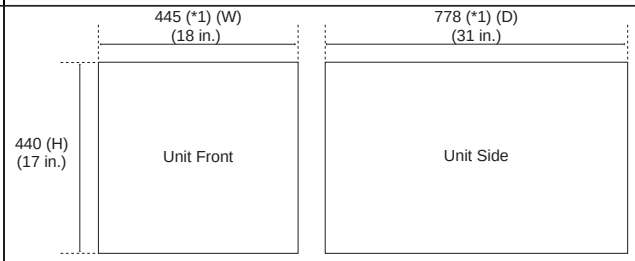
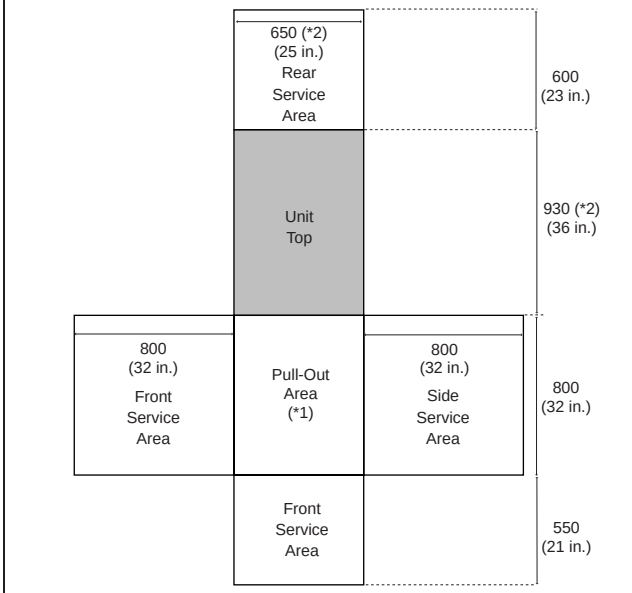
Item		Specification	
Weight		108 kg (238.41 lb.) (max.) (*1)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100V (±10%)	Single phase AC200V (±10%)
Max. Current		19.0 A	9.5 A
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*2)	
	Non-operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-operating	0.4 G	
Noise		55 db(A) (*3)	
Form Factor		Rackmount (10U)	

*1: Include Rack Rail weight.

*2: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*3: The indicated noise is the mean value of measurements obtained when the server unit is installed in an 1800mm (71-inch) rack server in a low-noise anechoic chamber. The actual noise measured at the installation site may be greater than the indicated value due to background noise and echoes.

Table 8.3 Installation Specifications of the PRIMEPOWER600 Rackmount (10U) Server (2/2)

Item	Specification
Unit Dimensions (units : mm)	
Service Areas (units : mm)	

*1: Not including any projections.

*2: Keep the pull-out area clear so that units inside the PRIMEPOWER600 Rackmount (10U) Server can be pulled out from the rack cabinet when performing maintenance.

*3: When a GP7B7RK3x/RK4x rack cabinet is used

8.3.3 Connecting the console

A device terminal such as a personal computer must be connected to the serial port to act as the console for PRIMEPOWER600 Rackmount (10U) Servers to which a display or keyboard are not connected. Pay attention to the following when connecting the console to the serial port on the PRIMEPOWER600 Rackmount (10U) Server.

Connecting the serial cable:

Connect to serial A port.

Communication settings on the terminal:

Set to 8 bits, 1 stop bit, parity OFF, and 9600 baud.

8.3.4 Turning the power on

The following describes how to turn the power on.

⚠CAUTION

Data Destruction

Do not turn the console terminal (device connected to the serial port) on after turning the PRIMEPOWER Server on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation potentially causing data to be lost.

IMPORTANT

- If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.
- When the PRIMEPOWER Server is turned on, a self-diagnostics routine automatically verifies whether or not hardware errors are occurring. If this routine detects any hardware errors, system power is automatically turned off and on again (if the MODE switch on the control panel is set to AUTO or SECURE). This power off/on retry sequence is performed twice. In both retries, the routine checks for errors. If an error occurs in both cases, the routine judges that the system cannot be booted up and stops the system bootup sequence.

Procedure

1. Turn the AC main line power on.
2. Turn the power switches of the console terminal and peripheral devices on.

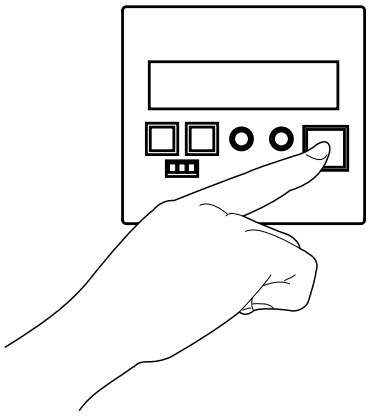


Figure 8.5 Turning the power on

3 Press the POWER switch on the control panel of the PRIMEPOWER600 Rackmount (10U) Server.

The POWER LEDs of the PRIMEPOWER Server and any peripheral devices connected via the RCI port should now light up.

Note: Operation of the POWER switch is disabled when the MODE switch is set to SECURE.

A keyboard power-on function is not supported.

8.3.5 Turning the power off

The following describes how to turn the power off.

⚠CAUTION

Data Destruction

Before turning the power off, check the answer to each of the following points is "No", or data may be lost:

- Are there any currently executing programs?
- Are there any current users?
- Are floppy disks or tape cartridges still inserted in their drives?

Backup files as necessary before turning the power off.

Also, do not turn off the console while the PRIMEPOWER Server is turned on. When the MODE switch is set to AUTO or MANUAL, a break signal may cause the bootup sequence to shift to display of the ok prompt during Solaris operation potentially causing data to be lost.

IMPORTANT

If the MODE switch is set to AUTO or SECURE on a server unit on which "auto power control by software" is set, and the AC power is interrupted, the power will sometimes automatically turn on at the moment that the AC power supply is resumed. To keep the power from being turned on automatically like this, set the MODE switch to MANUAL when restoring AC power after an interruption.

Procedure

1 Press the POWER switch on the control panel of the PRIMEPOWER600 Rackmount (10U) Server.

2 Press the POWER switch again within five seconds (scftool default interval).

This starts the system shutdown sequence. The power turns off after the system shuts down.

For details on scftool, refer to the "User’s Guide" included with the "Enhanced Support Facility."

3 Turn the power switches of peripheral devices off after the PRIMEPOWER600 Rackmount (10U) Server power is turned off.

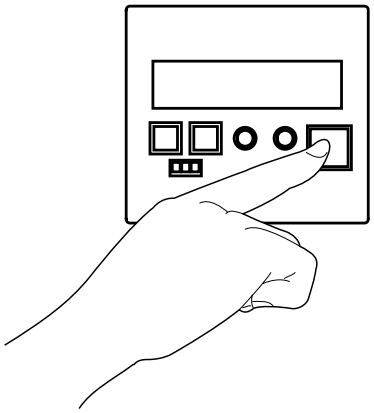


Figure 8.6 Turning the power off

8.3.6 Installing the Enhanced Support Facility package

⚠CAUTION

Data Destruction

Install the "Enhanced Support Facility" before using the system. Without this package, front panel operation or hardware errors may cause the system to shutdown or data to be lost.

With the PRIMEPOWER servers, be sure to install all of the programs provided with the "Enhanced Support Facility" to ensure the high reliability functions of the service processors. For details, refer to the "User's Guide" included with the "Enhanced Support Facility."

8.3.7 How to enable/disable the break signal

⚠CAUTION

Data Destruction

If improper commands are used at the ok prompt, data may be lost. If you need to use any command except those shown in this manual, you should fully understand the function and usage of the command before using it.

Data is sometimes lost as the bootup sequence shifts to display of the ok prompt during system operation in result to a break signal from the console terminal connected to the serial port or the STOP+A command from the keyboard.

To prevent this kind of response to a break signal arriving from the serial port or the STOP+A command from the keyboard, make the following settings using the set-fw-options command shown below with the ok prompt displayed on screen, and then set the MODE switch on the control panel to the SECURE mode.

How to disable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting. The factory default is that nothing is set.

```
ok  print-fw-options
fw-options =
```

2 Use the set-fw-options command to set the value (no-break) for disabling the break signal and STOP command.

```
ok  set-fw-options no-break
fw-options = no-break
```

3 Use the print-fw-options command to make sure that no-break is correctly set.

```
ok  print-fw-options
fw-options = no-break
```

How to enable the break signal and STOP+A command

1 Use the print-fw-options command to check the current setting values. If the no-break shown below is not lost, the break signal and STOP+A command are already enabled.

```
ok  print-fw-options
fw-options = no-break
```

2 Use the clear-fw-options command to cancel the no-break setting.

```
ok  clear-fw-options no-break
fw-options =
```

3 Use the print-fw-options command to make sure that nothing is set.

```
ok  print-fw-options
fw-options =
```

8.3.8 LAN expansion note

When LAN ports have seen added with PCI cards, and each LAN port given its own MAC address, these should be enabled from the ok prompt, as follows:

```
ok  setenv  local-mac-address?  true
```

8.4 Expanding the Server Unit

⚠CAUTION

The following operations should be performed by a service engineer, and not by the user. Otherwise, the product may malfunction.

- Mounting/removal of optional internal units

The following optional items can be added to the PRIMEPOWER600 Rackmount (10U) Server.

- Power supply units
- CPU modules
- Memory modules
- Hard disk drives
- PCI cards

Systemboard mounting locations are as follows:

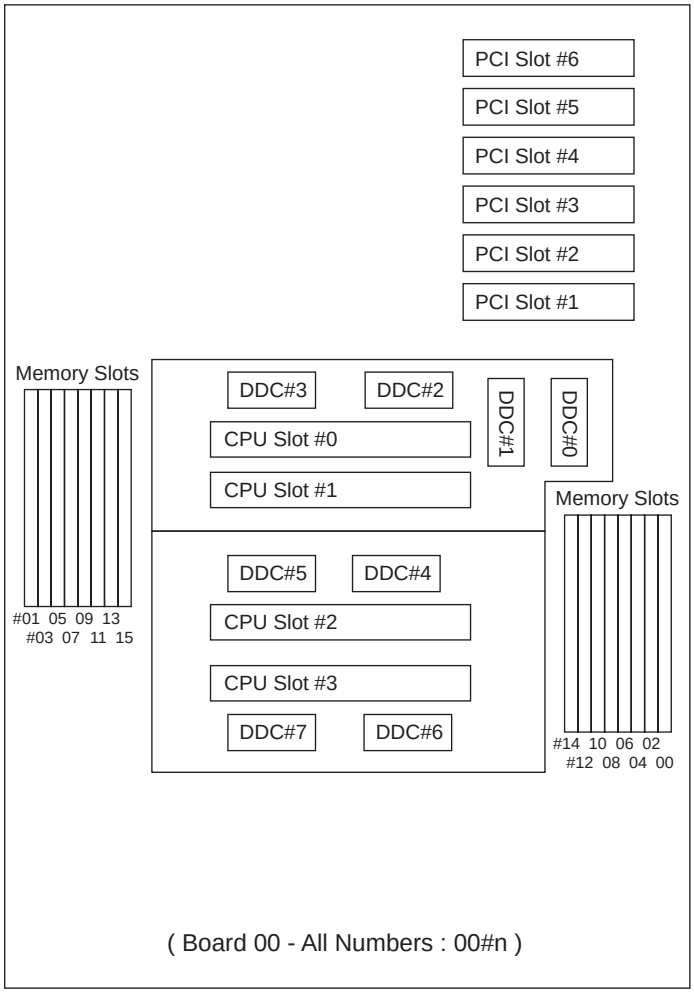


Figure 8.7 PRIMEPOWER600 Rackmount (10U) Base Systemboard

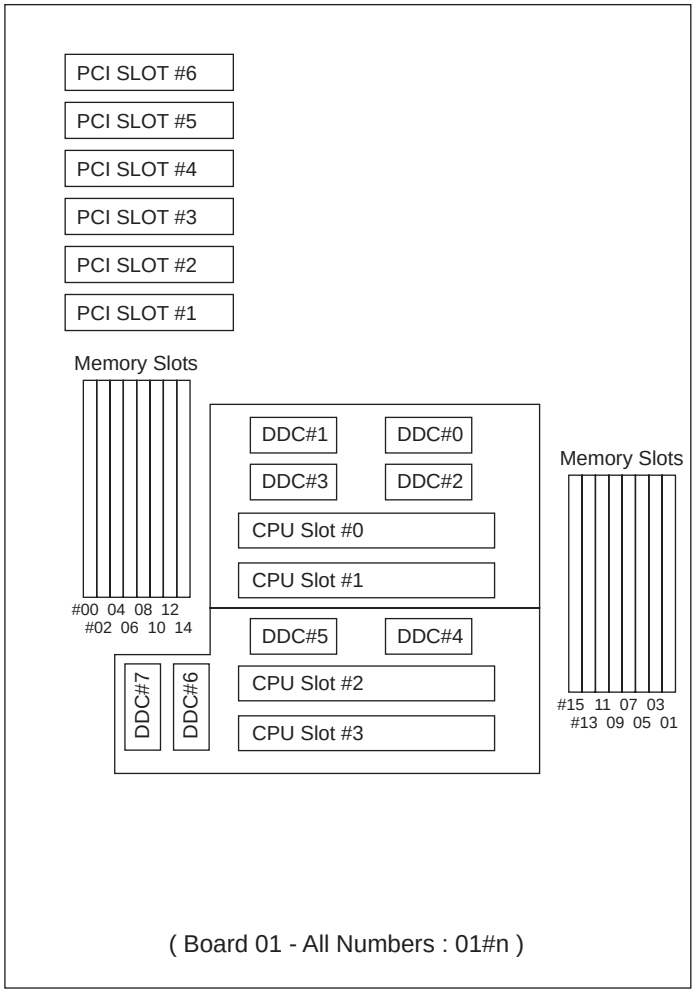


Figure 8.8 PRIMEPOWER600 Rackmount (10U) Expansion Systemboard (Option)

8.4.1 Adding power supply units

IMPORTANT

Adding an optional redundant power supply unit allows hot-swapping of the power supply units.

⚠CAUTION

Unit Damage

The unit may malfunction if hot-swapping of the power supply units is not performed correctly. Contact the service engineer if a power supply unit must be hot-swapped.

Power supply units (FEP) installed on the PRIMEPOWER600 Rackmount (10U) Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in "Enhanced Support Facility" to perform hot-swapping. For details on how to swap power supply units, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

8.4.2 Adding CPU modules

A total of eight CPU module slots are provided on the PRIMEPOWER600 Rackmount (10U) Systemboard.

IMPORTANT

The Expansion Systemboard must be first installed before the fifth and further CPUs can be added.

When adding CPU modules the following restrictions apply:

- Only SPARC64 GP processors can be used.
- To ensure they all operate at the same clock speed, have the same cache size and use the same CPU stepping, the model name must be identical for all CPUs.
- CPU modules must be added according to Table 8.4 .

IMPORTANT

Operation for configurations other than those shown in Table 8.4 cannot be guaranteed.

Table 8.4 Allowed CPU Module Configurations

No. of CPUs	CPU slot #								No. of DDCs	DDCs to be added (incremental)
	00 #0	00 #1	00 #2	00 #3	01 #0	01 #1	01 #2	01 #3		
1	O	-	-	-	-	-	-	-	2	DDC 00#0, DDC 00#1
2	O	-	O	-	-	-	-	-	4	DDC 00#4, DDC 00#5
3	O	O	O	-	-	-	-	-	6	DDC 00#2, DDC 00#3
4	O	O	O	O	-	-	-	-	8	DDC 00#6, DDC 00#7
5	O	O	O	O	O	-	-	-	10	DDC 01#0, DDC 01#1
6	O	O	O	O	O	-	O	-	12	DDC 01#4, DDC 01#5
7	O	O	O	O	O	O	O	-	14	DDC 01#2, DDC 01#3
8	O	O	O	O	O	O	O	O	16	DDC 01#6, DDC 01#7

8.4.3 Adding memory modules

A total of 32 memory module slots are provided on the PRIMEPOWER600 Rackmount (10U) Systemboard.

IMPORTANT

The Expansion Systemboard must be first installed before the seventeenth and further memory modules can be added.

When adding memory modules the following restrictions apply.

IMPORTANT

Operation for configuration other than those described below cannot be guaranteed.

- Each sequential group of 4 memory slots (#0-3, #4-7, #8-11, #12-15) must be either left empty or completely filled with 4 identical memory modules.

8.4.4 Adding hard disk drives

Disk drive configuration

Up to six hot-swappable UltraSCSI disk drives can be added to the PRIMEPOWER600 Rackmount (10U) Server. Each of the disk drive bays is provided with an ACTIVE LED and a FAULT LED.

The ACTIVE LED lights up (green) when a hard disk drive is operating (reading or writing). The FAULT LED lights up according to the swapping procedure when hot-swapping a hard disk drive.

Hot-swapping hard disk drives

Hard disk drives installed on the PRIMEPOWER600 Rackmount (10U) Server are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE and FAULT LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if the hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

8.4.5 Adding PCI cards

IMPORTANT

The Expansion Systemboard must be first installed before the seventh and further PCI slots can be added.

There are three types of PCI card: a PCI card designed to operate in 3.3V slots, a PCI card designed to operate in 5V slots, and a PCI (universal) card design to operate in both 3.3V and 5V slots. Though most PCI cards operate at a 33MHz clock, some cards operate at a 66MHz clock.

Refer to Table 8.5 and Figure 8.9 below for details of the PCI slot positions when installing PCI cards.

Table 8.5 PCI Slot Specifications

	PCI Slot number	PCI Bus	Slot / Card Width (bits)	PCI Clock Rate (MHz)	Card Input Voltage	long / short
Base PCI Slots	00 # 6	D	64 / 32, 64	33	5V or Universal	long
	00 # 5	C	64 / 32, 64	33	5V or Universal	long
	00 # 4	C	64 / 32, 64	33	5V or Universal	long
	00 # 3	C	64 / 32, 64	33	5V or Universal	long
	00 # 2	B	64 / 32, 64	33 / 66	3.3V or Universal	long
	00 # 1	A	64 / 32, 64	33 / 66	3.3V or Universal	long
Expansion PCI Slots	01 # 6	H	64 / 32, 64	33	5V or Universal	long
	01 # 5	G	64 / 32, 64	33	5V or Universal	long
	01 # 4	G	64 / 32, 64	33	5V or Universal	long
	01 # 3	G	64 / 32, 64	33	5V or Universal	long
	01 # 2	F	64 / 32, 64	33 / 66	3.3V or Universal	long
	01 # 1	E	64 / 32, 64	33 / 66	3.3V or Universal	long

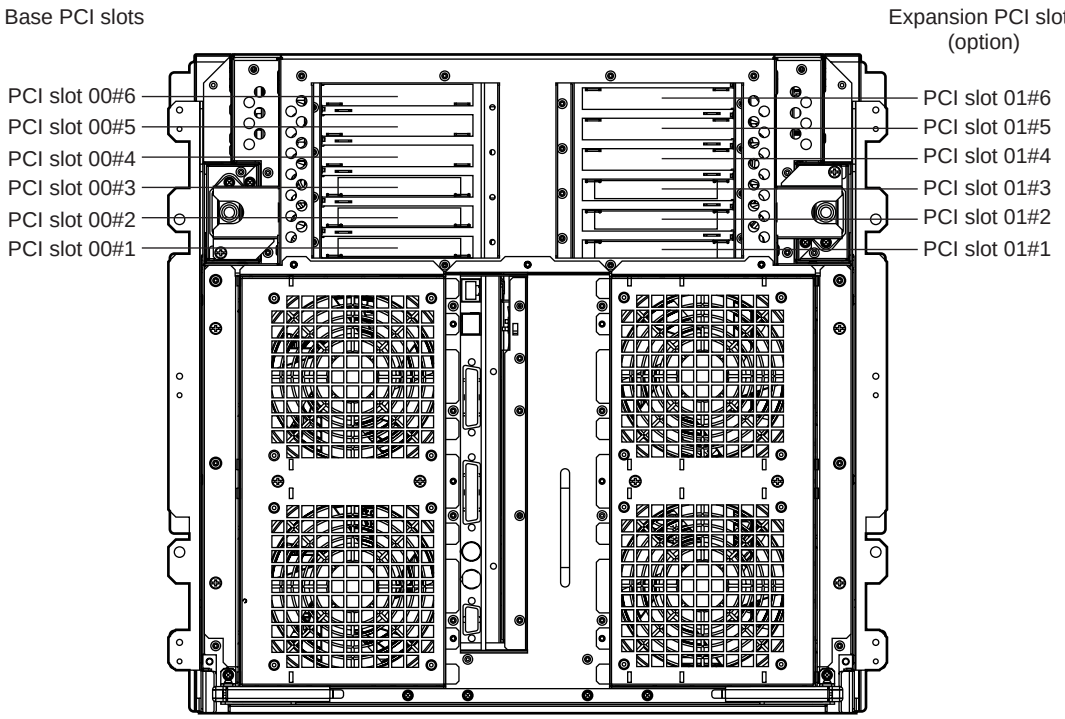


Figure 8.9 Rear View of PRIMEPOWER600 Rackmount (10U) showing position of PCI slots

9

Expansion Disk Cabinet

This chapter gives an overview of the Expansion Disk Cabinet, names and functions of parts, installation, disk drive configuration, and hot-swapping of redundant components.

CONTENTS

9.1 Overview 166
9.2 Names and Functions of Parts 166
9.3 Preparations for Use 171
9.4 Disk Drive Configuration 174
9.5 Hot-swapping Redundant Components 175

9.1 Overview

- Two 40MB/s UltraSCSI (Differential) buses are supported.
- Up to five hard disk drives can be installed per UltraSCSI bus, for up to ten hard disk drives can be per Expansion Disk Cabinet.
- Hard disk drives are hot-swappable.
- A redundant power supply unit can be installed and PSUs are hot-swappable when configured redundantly.
- Fans are configured redundantly so the others to continue working even if one fails.
- CHECK LED and POWER LED shows status of the Expansion Disk Cabinet.
- Power supply operation can be slaved to that of the PRIMEPOWER Server by an RCI (Remote connection Interface) cable.
- The front panel has a lock to prevent unauthorized access to the internal units of the Expansion Disk Cabinet.

9.2 Names and Functions of Parts

This section describes the names and functions of parts on the front and rear of the Expansion Disk Cabinet.

9.2.1 Front side

The names and functions of parts on the front of the Expansion Disk Cabinet are as follows.

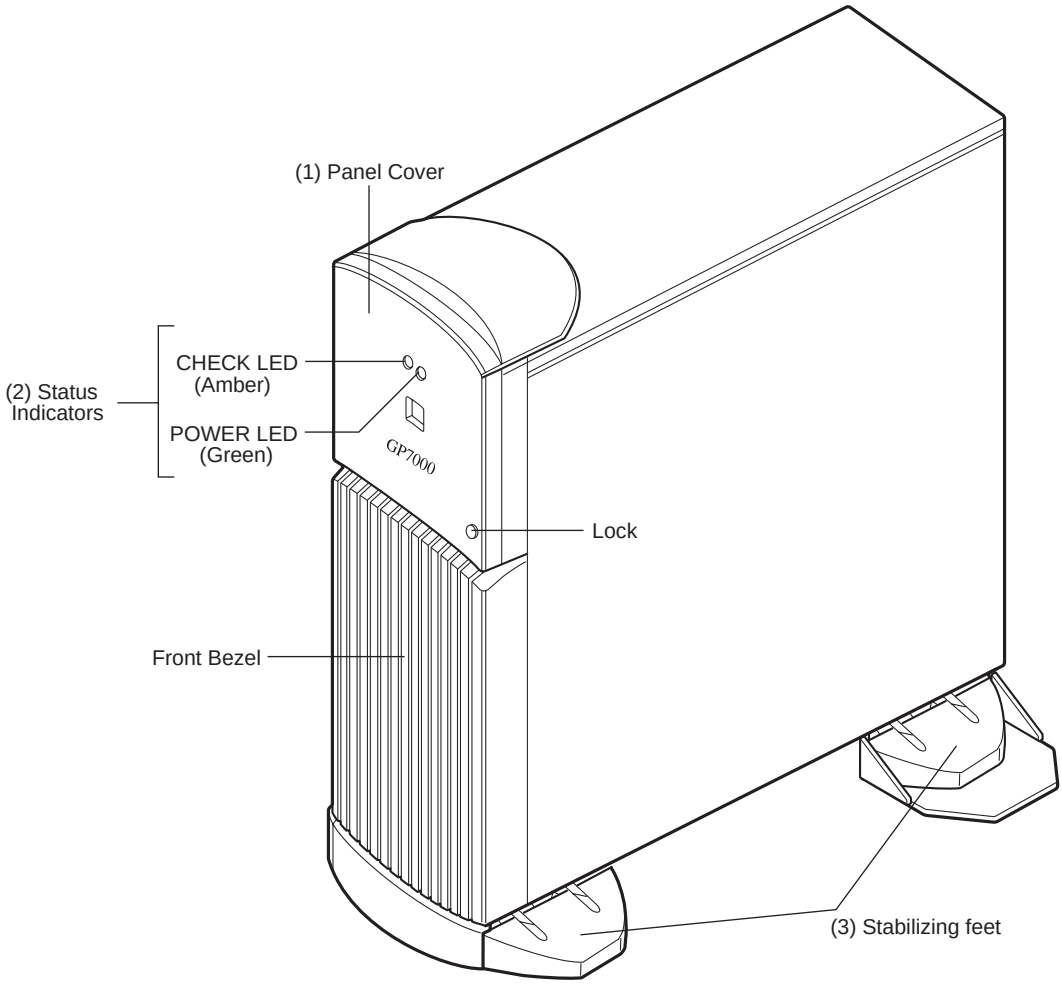


Figure 9.1 Front of Expansion Disk Cabinet

(1) Panel cover

The panel cover can be opened to its right after being unlocked.

(2) Status Indicator LEDs

The POWER LED indicates that the power to the Expansion Disk Cabinet is on.

If an error occurs inside the Expansion Disk Cabinet, the CHECK LED lights as shown in Table 9.1 .

Table 9.1 CHECK LED Indicator

LED	Status	Description
Dark	Normal	
Blinking	Response to maintenance command	Blinks in response to server unit maintenance /repair procedures (allowing confirmation or the unit to be repaired).
Lit	Error detected	Lights when a power supply unit or fan malfunctions.

When the CHECK LED lights, note down the lit state of this LED, and contact a service engineer.

(3) Stabilizing feet

The stabilizing feet prevent the Expansion Disk Cabinet from falling over when it is pushed from its side or if there is an earthquake. When installing the Expansion Disk Cabinet, be sure to install the stabilizing feet. Also, when the Expansion Disk Cabinet is installed next to the PRIMEPOWER Server, install the stabilizing feet only on the opposite side of the Expansion Disk Cabinet.

9.2.2 Rear side

The names and functions of parts on the rear of the Expansion Disk Cabinet are as follows.

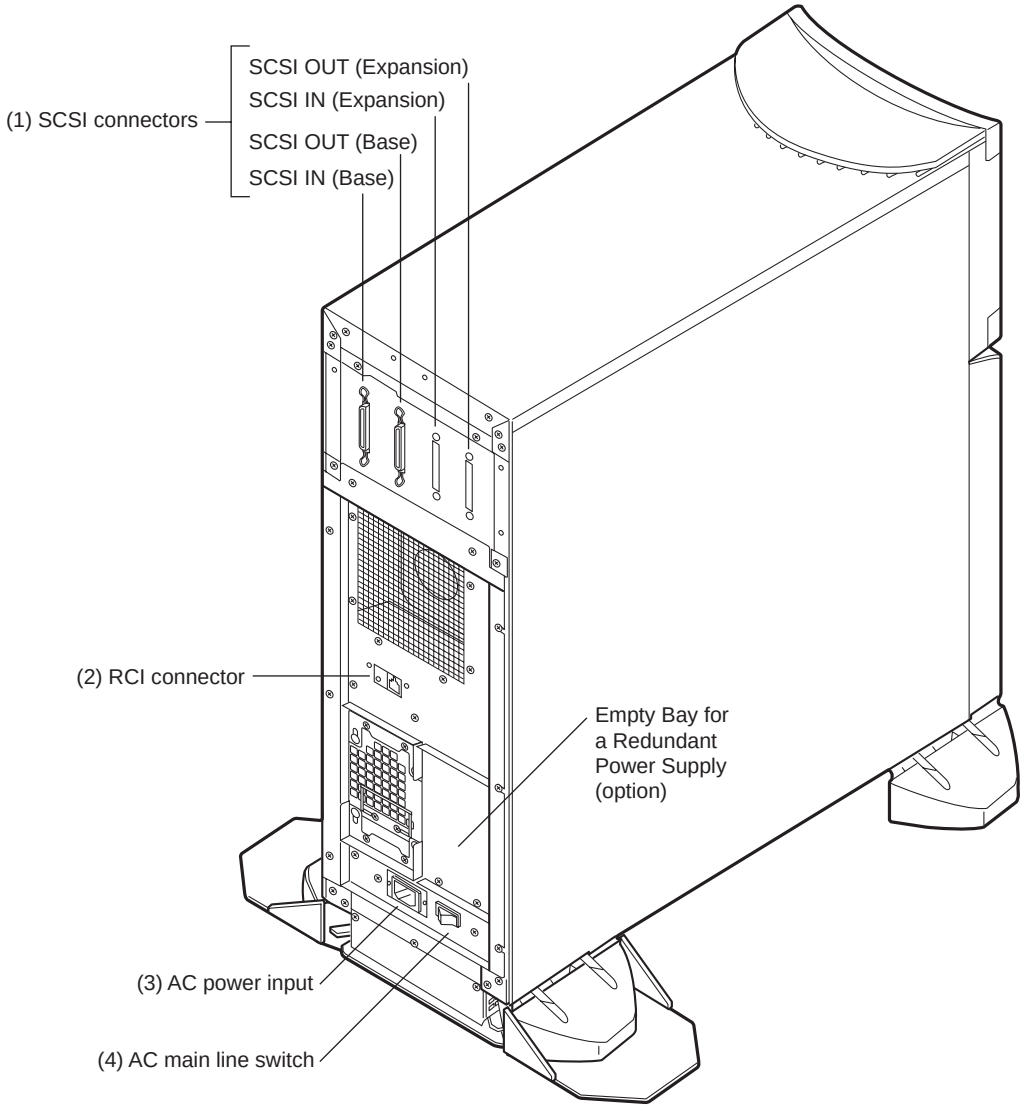


Figure 9.2 Rear of Expansion Disk Cabinet

(1) SCSI connectors

The Expansion Disk Cabinet is equipped with two built-in SCSI connectors, one for the base SCSI bus and the other for the expansion SCSI bus.

In the base configuration, connect the SCSI cable only to the SCSI IN (base) connector and connect the terminator plug to the SCSI OUT (base) connector.

If the Disk Expansion Unit is installed, connect the SCSI cable to the SCSI IN (expansion) connector and connect the terminator plug to the SCSI OUT (expansion) connector.

(2) RCI connector

Use the RCI cable provided with the Expansion Disk Cabinet to connect it to the PRIMEPOWER Server. The RCI splitter/connector should be used to attach the RCI cable.

A terminator must also be connected.

The appropriate RCI commands must be issued to add/set-up an Expansion Disk Cabinet.

(3) AC power input

Connect the power cable to this point.

(4) AC main line switch

⚠CAUTION

Data destruction

Never turn the AC main line switch or disconnect the power cable while the Expansion Disk Cabinet is turned on. If you do so, data in the disk drive may be lost.

This is the main power supply switch and should normally be left in the "|" position.

In this position the Expansion Disk Cabinet is slaved to the PRIMEPOWER Server's power supply and will be turned on and off by commands from the Server.

If set to the "0" position, the Expansion Disk Cabinet will not turn on when the PRIMEPOWER Server is started up.

9.3 Preparations for Use

This section describes the following:

- Installation notes
- Installation specifications

9.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the Expansion Disk Cabinet may be damaged. Be sure to follow these notes.

- Do not block the ventilation holes.
- Do not install the Expansion Disk Cabinet where it will be exposed to sunlight or sources of heat.
- Do not install the Expansion Disk Cabinet in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the Expansion Disk Cabinet isolated from vibration. Install the Expansion Disk Cabinet on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the Expansion Disk Cabinet may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the Expansion Disk Cabinet. Do not use the top of the Expansion Disk Cabinet as a workspace.
- To prevent condensation in the Expansion Disk Cabinet, do not raise the ambient room temperature rapidly in winter.

  Use the Expansion Disk Cabinet only after it has warmed up sufficiently.
- Do not install the Expansion Disk Cabinet near EM noise generating devices such as photocopiers, air conditioners, or welders.
- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the Expansion Disk Cabinet to malfunction.
- When moving the Expansion Disk Cabinet, do not pull on the front cover. Otherwise, the server unit may be damaged.

9.3.2 Installation specifications

Table 9.2 and Table 9.3 show the installation specifications for the Expansion Disk Cabinet.

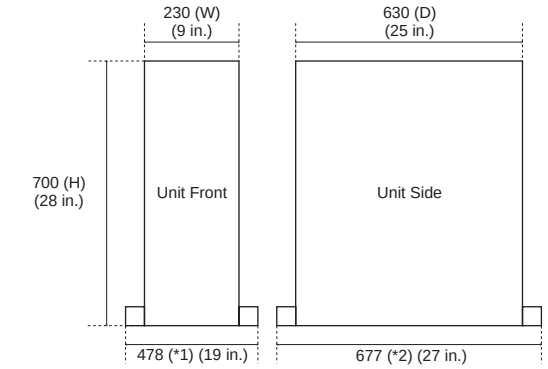
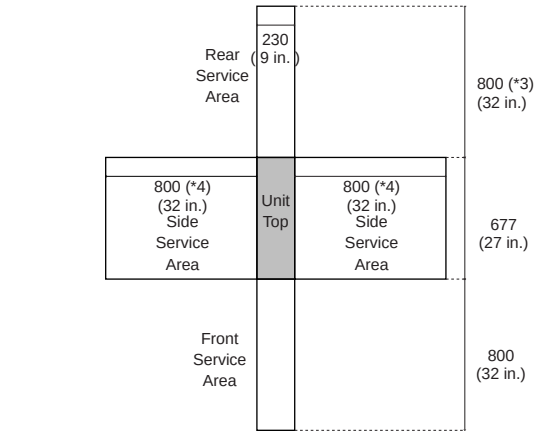
Table 9.2 Installation Specifications of the Expansion Disk Cabinet (1/2)

Item		Specification	
Weight		38 kg (83.78 lb.) (max.)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100 ~ 120V (±10%)	Single phase AC200 ~ 240V (±10%)
Max. Current		3.0 A (100V)	1.5 A (240V)
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*1)	
	Non-operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-operating	0.4 G	
Noise		47 db(A) (*2)	
Form Factor		Pedestal	

*1: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2: The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indicated noise due to background noise and echoes.

Table 9.3 Installation Specifications of the Expansion Disk Cabinet (2/2)

Item	Specification
Unit Dimensions (units : mm)	
Service Areas (units : mm)	

*1: The unit width including the Stabilizing Feet is 478 mm (19-inch).

*2: The unit depth including the skirt is 677 mm (27-inch).

*3: If it is possible to move the Expansion Disk Cabinet so that 800 mm (32-inch) or more space is available behind the unit when maintenance is performed, then 200mm (8-inch) of space is adequate is normal use. However, if optical cables are used, at least 300mm (12-inch) of space will be needed between the rear of the unit and the wall.

*4: If it is possible to move the Expansion Disk Cabinet so that 800mm (32-inch) or more space is available beside the unit when maintenance is performed, then no space is required in normal use.

9.4 Disk Drive Configuration

Up to ten hot-swappable UltraSCSI disk drives can be built into the Expansion Disk Cabinet. The disk drive cages shown in Figure 9.3 can be accessed by removing the front bezel. The base disk cage (bays #1 to #5) and the expansion disk cage (bays #1 to #5) are connected to the PRIMEPOWER Server by separate SCSI buses.

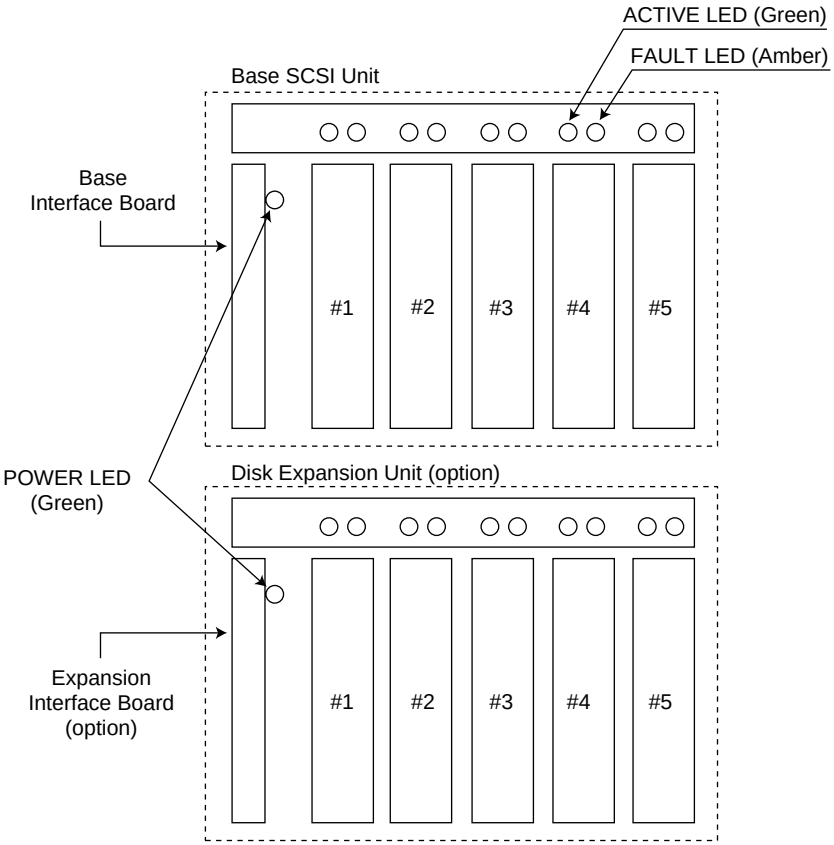


Figure 9.3 Full Disk Drive Configuration of Expansion Disk Cabinet

9.5 Hot-swapping Redundant Components

This section describes hot-swapping of redundant components.

9.5.1 Power supply units

⚠CAUTION

Unit Damage

The unit may be damaged if hot-swapping of power supply units is not performed correctly. Contact the service engineer if a power supply unit must be hot-swapped.

IMPORTANT

Adding an optional redundant power supply unit allows hot-swapping of the power supply units.

Power supply units installed on the Expansion Disk Cabinet are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping. For details on how to swap power supply units, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

9.5.2 Hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the Expansion Disk Cabinet are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE, FAULT and CHECK LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

10

Expansion File Unit Type-2

This chapter gives an overview of the Expansion File Unit Type-2, names and functions of parts, installation, configuration of the disk drives, and hot-swapping of redundant components.

CONTENTS

10.1 Overview 178
10.2 Names and Functions of Parts 178
10.3 Preparations for Use 180
10.4 Disk Drive Configurations 182
10.5 Hot-swapping Redundant Components 183

10.1 Overview

The following describes the key features of the Expansion File Unit Type-2

- Two 40MB/s UltraSCSI (Differential) buses are supported.
- In the base configuration, up to five hard disk drives can be mounted. Adding a File Unit Expansion Kit enables up to ten disk drives to be mounted. Alternately, adding an Expansion Tape Unit enables up to two 8mm tape units or DDS3 DAT drives to be mounted.
- Hard disk drives and tape units are hot-swappable.
- Redundant power supply units and tape units can be installed, and are hot-swappable.
- Fans are configured redundantly so the others continue working even if one fails.
- File Unit Type-2 status is displayed by CHECK and POWER LEDs.
- Power supply operation can be slaved to that of the PRIMEPOWER Server by an RCI (Remote Server Unit Interface) cable.

10.2 Names and Functions of Parts

This section describes the names and functions of parts on the front and rear of the Expansion File Unit Type-2.

10.2.1 Front side

The names and functions of parts on the front of the Expansion File Unit Type-2 are as follows.

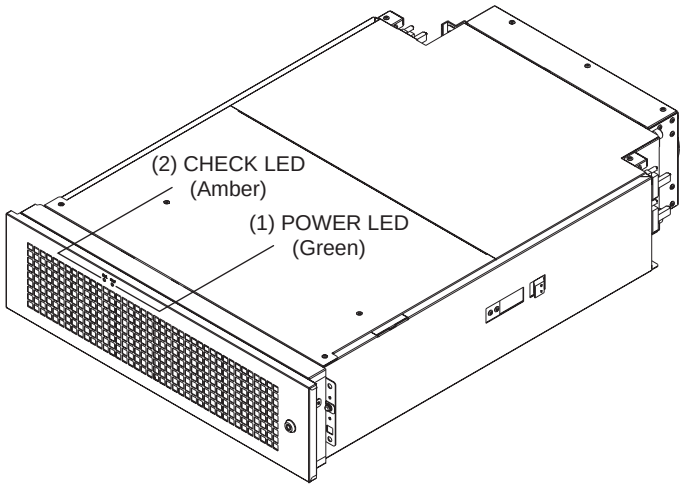


Figure 10.1 Front of Expansion File Unit Type-2

(1) POWER LED

The POWER LED indicates that power to the Expansion File Unit Type-2 is on.

(2) CHECK LED

The CHECK LED when an error occurs in the Expansion File Unit Type-2, as shown in Table 10.1 .

Table 10.1 CHECK LED

LED	Status	Description
Dark	Normal	
Blinking	Response to maintenance command	Blinks in response to server unit maintenance /repair procedures (allowing confirmation or the unit to be repaired).
Lit	Error detected	Lights when a power supply unit or fan malfunctions.

10.2.2 Rear side

The names and functions of parts on the rear side of the Expansion File Unit Type-2 are as follows.

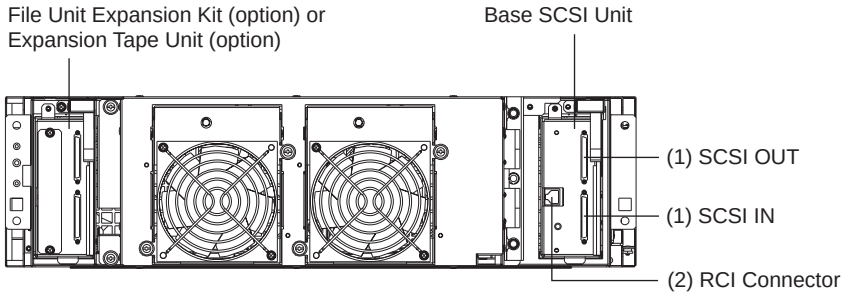


Figure 10.2 Rear of Expansion File Unit Type-2

(1) SCSI connectors

The Expansion File Unit Type-2 is equipped with two built-in SCSI connectors, one for the base SCSI bus and the other for the expansion SCSI bus.

In the base configuration, connect the SCSI cable only to the SCSI IN (base) connector and connect the terminator plug to the SCSI OUT (base) connector.

If the File Unit Expansion Kit is installed, connect the SCSI cable to the SCSI IN (expansion) connector and connect the terminator plug to the SCSI OUT (expansion) connector.

All of the Expansion File Unit Type-2 SCSI connectors are VHDCI type.

(2) RCI connector

Use the RCI cable provided with the Expansion File Unit Type-2 to connect it to the PRIMEPOWER Server. The RCI splitter/connector should be used to attach the RCI cable.

A terminator must also be connected.

The appropriate RCI commands must be issued to add/set-up an Expansion Disk File Unit Type-2.

10.3 Preparations for Use

This section describes the following:

- Installation notes
- Installation specifications

10.3.1 Installation notes

⚠CAUTION

Unit Damage

If the following notes are not observed the Expansion File Unit Type-2 may be damaged. Be sure to follow these notes.

Rack installation notes

The following installation instructions are intended to provide product safety requirements to be addressed when the end-use product manufacturer installs this product in their equipment.

- As the Expansion File Unit Type-2 is installed in a closed or multi-unit rack assembly, the operating ambient temperature inside of the rack environment may be greater than the room temperature. So, consideration should be given to installing the Expansion File Unit Type-2 in an environment compatible with the manufacturer's maximum rated ambient temperature.
  - Consideration for adjustment of air conditions like air circulation should be given to prevent the internal rack ambient temperature from exceeding the maximum operating temperature of this unit.
  - Maximum internal operating temperature of this unit: 35 deg. C (95 deg. F)
- Installation of the Expansion File Unit Type-2 should be such that the amount of air flow required for safe operation of the Expansion File Unit Type-2 is not compromised.
  - The Expansion File Unit Type-2 has ventilation openings at the front and rear faces of the unit.
  - To prevent overheating, do not cover or close these ventilation openings.
- Mounting of the Expansion File Unit Type-2 in the rack should be such that a hazardous condition does not result from uneven mechanical loading. To maintain the stability of the entire rack, please fix the rack to the wall or floor by suitable means.
  - Be careful of injuries during installation of the Expansion File Unit Type-2 into the rack.
  - Do not install the Expansion File Unit Type-2 into a rack if the server unit may make the entire rack unstable.
  - Maximum configured weight of this unit: 30 kg (66.14 lb.)
- If the Expansion File Unit Type-2 is supplied with power from a power strip or service outlet of other units, it may overload the power supply cord or the power strip of other units.

  - Confirm that the current rating of the power strip or service outlet exceeds the combined ratings of all equipment it is supplying.
  - Electrical ratings of this unit: Rated 100 to 240VAC, 3.0 to 1.5A, 50/60Hz, single-phase

- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to non-direct-to-mains connections (e.g. via power strips, etc.).

⚠CAUTION

Connect the ground before connecting any of the power supply lines. If all of the power cables from the Expansion File Unit Type-2 are connected to a single power strip, high leakage current exceeding the stipulated value may leak through to the earth lead of the power strip.

If the power strip is not directly connected to the main distribution panel, use a power strip with an industrial plug.

General installation notes

- Do not block the ventilation holes.
- Do not install the Expansion File Unit Type-2 where it will be exposed to sunlight or sources of heat.
- Do not install the Expansion File Unit Type-2 in dusty places or places where it will be exposed to corrosive gases or sea breezes.
- Keep the Expansion File Unit Type-2 isolated from vibration. Install the Expansion File Unit Type-2 on a level surface so that it does not tilt.
- Make sure that the AC power supply source is grounded properly using a maximum resistance of 100 Ohms. Also, do not ground the AC power supply source using a shared ground. Use only an independent grounding point. Otherwise, the Expansion File Unit Type-2 may malfunction.
- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.
- Do not place anything on the Expansion File Unit Type-2. Do not use the top of the Expansion File Unit Type-2 as a workspace.
- To prevent condensation in the Expansion File Unit Type-2, do not raise the ambient room temperature rapidly in winter.

  Use the Expansion File Unit Type-2 only after it has warmed up sufficiently.
- Do not install the Expansion File Unit Type-2 near EM noise generating devices such as photocopiers, air conditioners, or welders.
- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause the Expansion File Unit Type-2 to malfunction.
- When moving the Expansion File Unit Type-2, do not pull on the front cover. Otherwise, the Server may be damaged.
- The unit does not support dual AC power input / feed, even if both power cards come from the unit.

  Both AC power cords must be plugged into the same power grid / circuit.

10.3.2 Installation specifications

Table 10.2 shows the installation specifications of the Expansion File Unit Type-2.

Table 10.2 Installation Specification of Expansion File Unit Type-2

Item		Specification	
Weight		30 kg (66.14 lb.) (max.)	
Power Supply	Frequency	50/60 Hz (+2 ~ -4%)	
	Voltage	Single phase AC100 ~ 120V (±10%)	Single phase AC200 ~240V (±10%)
Max. Current		3.0 A (100V)	1.5 A (240V)
Leak Current		≤ 3.5 mA	
Frame Resistance		≤ 100Ω	
Temperature	Operating	5 ~ 35 ˚C (+41 ~ +95 F) (*1)	
	Non-operating	0 ~ 50 ˚C (+32 ~ +122 F)	
Humidity	Operating	20 ~ 80% RH (non-condensing)	
	Non-operating	8 ~ 80% RH (non-condensing)	
Vibration	Operating	0.2 G	
	Non-operating	0.4 G	
Noise		50 db(A) (*2)	
Form Factor		Rackmount (4U)	

*1: If the ambient temperature exceeds 35 deg. C (95 deg. F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2: The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indicated noise due to background noise and echoes.

10.4 Disk Drive Configurations

In the base configuration, up to five disk drives can be mounted. Adding a File Unit Expansion Kit enables up to ten disk drives to be mounted. Alternately, adding a Tape Unit Bay Kit enables up to two 8mm tape units or DDS3 DAT drives to be mounted.

Removing the front cover allows you to access the disk drive cages as shown in Figure 10.3 and Figure 10.4 . Figure 10.3 shows the disk drive configuration when a File Unit Expansion Kit is added to the Base SCSI Unit. Figure 10.4 shows the disk drive configuration when a Tape Unit Bay Kit is added. The base disk cage (bays #1 to #5) and the expansion disk cage (bays #1 to #5) or tape drive cage (bays #1 and #2) are connected to the PRIMEPOWER Server by separate SCSI buses.

IMPORTANT

Set the SCSI ID of the tape unit in tape bay #1 to "5" and the SCSI ID of the tape unit in tape bay #2 to "3".

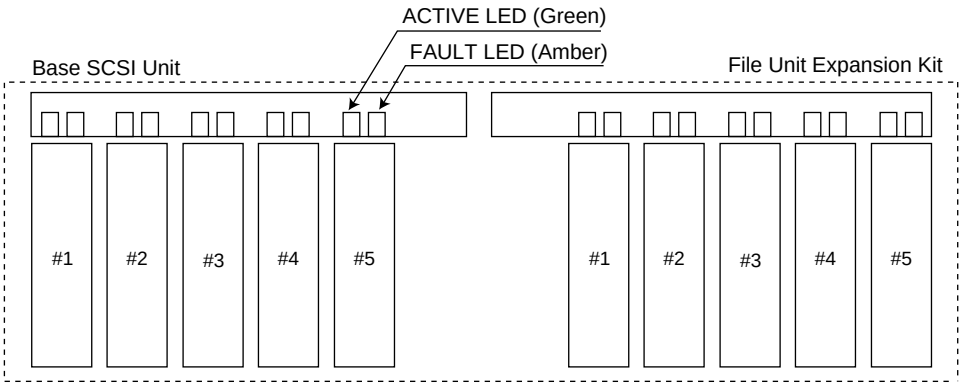


Figure 10.3 Full Disk Drive Configuration of Expansion File Unit Type-2

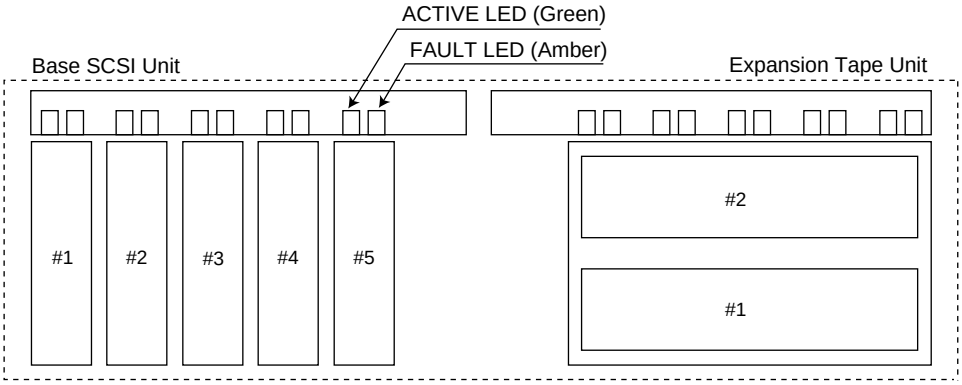


Figure 10.4 Disk Drive + Tape Drive Configuration of Expansion File Unit Type-2

10.5 Hot-swapping Redundant Components

This section describes hot-swapping of redundant components.

10.5.1 Power supply units

⚠CAUTION

Unit Damage

The unit may be damaged if hot-swapping of power supply units is not performed correctly. Contact the service engineer if a power supply unit must be hot-swapped.

IMPORTANT

Adding an optional redundant power supply unit allows hot-swapping of the power supply units.

Power supply units installed on the Expansion File Unit Type-2 are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping. For details on how to swap power supply units, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

10.5.2 Hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the Expansion File Unit Type-2 are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping while monitoring the state of the ACTIVE, FAULT and CHECK LEDs. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

11

Internal I/O Units

This chapter gives an overview of how to handle the various internal I/O units.

CONTENTS

11.1 Hard Disk Drives 186
11.2 CD-ROM Drive 188
11.3 DAT Drive (DDS3) 191
11.4 DAT Drive (DDS4) 198
11.5 8mm Tape Drive 207
11.6 DLT Tape Drive 215

11.1 Hard Disk Drives

This section describes the following items:

- SCSI ID
- Handling precautions
- Formatting hard disk drives
- Backup up data
- Hot-swapping hard disk drives

11.1.1 SCSI ID

The SCSI ID of hard disk drives is automatically determined by where the disk is mounted in the disk drive configuration.

11.1.2 Handling precautions

⚠CAUTION

Unit Damage

Pay attention to the following points when handling the hard disk drive. If these precautions are not observed the hard disk drive may be damaged or data lost.

- Do not subject the unit to excessive impact.
- Do not bring the unit near to equipment (motors, speakers, etc.) that generate strong magnetic fields.
- Do not store the unit in locations likely to cause condensation inside the unit or in locations subject to sudden changes in temperature or humidity.

11.1.3 Formatting hard disk drives

IMPORTANT

When a disk is formatted, any data on the disk is lost. Take care when selecting which the drive to format.

Back up data as necessary before formatting a disk drive.

The disk drives are pre-formatted at factory, so initial formatting by the user is not required.

If a new hard disk drive must be formatted later, use the Solaris format utility to format the disk. Select "Auto configure" when using the format utility to format a disk drive.

11.1.4 Backing up data

The hard disk drives used in the PRIMEPOWER are highly reliable. Even so, accidents can still cause disk drives to malfunction. If a disk drive malfunctions, the recorded data either will not be recoverable, or may take an extremely long time to recover. As insurance against unexpected accidents, we recommend periodic backing up of valuable data to a tape drive.

11.1.5 Hot-swapping hard disk drives

⚠CAUTION

Data Destruction

Data may be lost if hot-swapping of hard disk drives is not performed correctly. Contact the service engineer if a hard disk drive must be hot-swapped.

IMPORTANT

To utilize the hot-swapping functions of the hard disk drive, use the option software (SynfinityDISK) to perform mirroring.

Hard disk drives installed on the PRIMEPOWER are hot-swappable. To enable hot-swapping, use the tools (machine administration) contained in the "Enhanced Support Facility" to perform hot-swapping. For details on how to swap hard disk drives, refer to the "Machine Administration Instructions" included with the "Enhanced Support Facility".

11.2 CD-ROM Drive

This section describes the following items:

- Names and functions of parts
- CD-ROM discs
- CD-ROM disc handling precautions
- Inserting a CD-ROM disc
- Ejecting a CD-ROM disc

11.2.1 Names and functions of parts

The following describes the names and functions of parts of the CD-ROM drive.

Figure 11.1 shows the front panel of the CD-ROM drive.

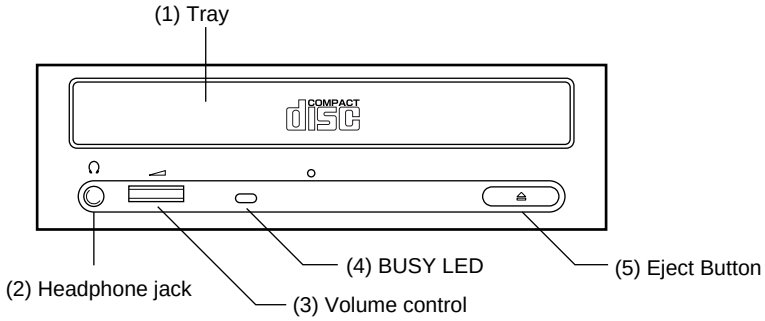


Figure 11.1 Front Panel CD-ROM Drive

(1) Tray This holds the CD-ROM.

(2) Headphone jack

Connect the headphone's mini-plug to this jack.

To play back an audio CD and listen to it on headphones, audio software will be required.

(3) Volume control

Use this dial to control the sound volume when using headphones.

(4) BUSY LED

This LED lights (green) when the CD-ROM is being accessed.

(5) Eject Button

Press this button to open and close the tray.

11.2.2 CD-ROM discs

Only CD-ROM discs with the mark shown in Figure 11.2 can be used in this CD-ROM drive.

Figure 11.2 CD-ROM Disc Mark

11.2.3 CD-ROM disc handling precautions

⚠CAUTION

- Do not scratch the surface of a CD-ROM disc. Pay special attention when removing a CD-ROM disc from its case.
- Do not widen the center hole of a CD-ROM disc.
- Do not write on a CD-ROM disc with a ball-point pen or pencil.
- Do not clean a CD-ROM disc with benzene, paint thinner, water, record spray, or an antistatic agent.
- Do not expose a CD-ROM disc to heat or sunlight.
- Do not store a CD-ROM disc in a place that undergoes rapid changes in temperature or humidity.
- If a CD-ROM disc is not being used, remove it from the CD-ROM drive, and store it in its case to protect it from dust, scratching and breakage.

11.2.4 Inserting a CD-ROM disc

1. With the PRIMEPOWER's POWER LED lit, check that the BUSY LED on the front panel of the CD-ROM drive is out.
2. Press the Eject button. The tray of the CD-ROM drive comes out.
3. Place the CD-ROM disc on the tray.
4. Repress the Eject button.

   The tray goes in, and the CD-ROM disc is mounted in the drive.

11.2.5 Ejecting a CD-ROM disc

1. If the system is running, check that the disk is not in use by a user or a program. If the CD-ROM disc is in use, the user process should be stopped to enable ejection of the CD-ROM disc.
2. Execute the Solaris eject command, or use the "Eject disk" function in the Volume Manager. The tray comes out.
3. Remove the CD-ROM disc, then repress the Eject button.

   The tray goes in.

11.3 DAT Drive (DDS3)

Note: DDS3 DAT drive can be installed in the Expansion File Unit Type-2.

This section describes the following items:

- Names and functions of parts
- SCSI ID
- OS settings
- Data cartridges
- Data cartridge handling precautions
- Write-protecting data cartridges
- Loading data cartridges
- Ejecting data cartridges
- Cleaning the tape heads

11.3.1 Names and functions of parts

The following describes the names and functions of individual components of the DDS3 DAT drive.

Figure 11.3 shows the front panel of the DAT Drive.

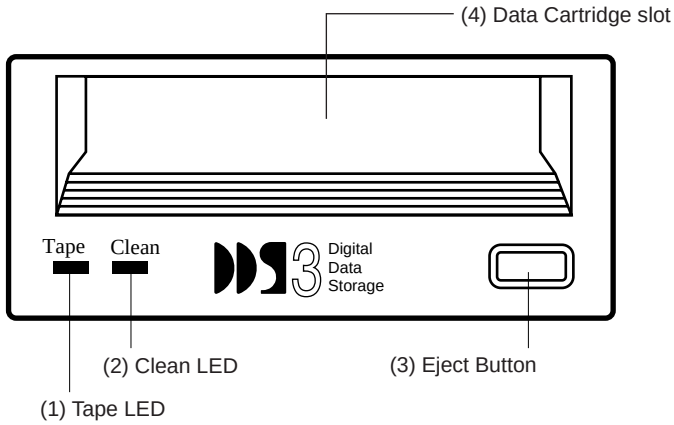


Figure 11.3 Front Panel of DDS3 DAT Drive

(1) Tape LED

This LED lights up (green) when a data cartridge is loaded, and blinks (green) when the DAT drive is operating.

For details, see Table 11.1 .

(2) Clean LED

When this LED starts blinking, the head of the DAT drive should be cleaned using a cleaning cartridge or the data cartridge or the cleaning cartridge is near the end of its useful life.

The Clean LED also lights up (amber) if the DAT drive malfunctions.

For details, see Table 11.1 .

Table 11.1 DDS3 DAT Drive LED Indicators

LED		DAT Drive Status
Tape	Clean	
Dark	Dark	Data cartridge is not loaded.
Lit		Data cartridge is loaded.
Blinking (1/2sec interval)		Tape is loading / unloading, or drive-diagnostics are running.
Blinking (1/4sec interval)		Accessing tape (Read / Write)
(any)	Lit	Drive has malfunctioned.
	Blinking (1/2sec interval)	Tape head cleaning is required.

(3) Eject Button

⚠CAUTION

Data Destruction

Do not press the Eject button during operation (when the tape LED is blinking). If the Eject button is held down for about five seconds, or pressed 3 times within a 5 minute interval, the forced ejection function will execute, and any data being written may be lost.

Press the Eject button to remove the data cartridge. Before removing a data cartridge, make sure that the tape LED is out.

If the DAT Software (or operating system) has disabled removal of a data cartridge, the cartridge cannot be removed by pressing the Eject button.

(4) Data Cartridge Slot

⚠CAUTION

Never insert your fingers or other foreign objects in the data cartridge slot, as this may damage the unit or cause data to be lost.

11.3.2 SCSI ID

Set the SCSI ID of the DAT drive DAT drive to "5" if it is the 1st drive in the PRIMEPOWER or the Expansion File Unit Type-2. Set the SCSI ID to "3" if it the 2nd drive.

11.3.3 OS settings

Before using a DDS3 DAT drive, the /kernel/drv/st.conf file must be modified, as follows:

1. Copy the original st.conf file:
   ```
   # cp /kernel/drv/st.conf /kernel/drv/st.conf.old
   ```
2. Add the following lines to the /kernel/drv/st.conf file:

```
tape-config-list =
          "HP         C1537A", "HP DDS3 4mm DAT", "HP_data2";
HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
```

IMPORTANT

There must be exactly six spaces between HP and C1537A. If another tape-config-list has already been defined, use a "," as a separator and add the new lines as shown in the following example.

```
Tape-config-list =
          "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC",
          "HP        C1537A", "HP DDS3 4mm DAT", "HP_data2";
EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;

HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
```

3. Shut the system down:
   ```
   # shutdown -y i0
   ```
4. Then reboot the system, using the -r flag:
   ```
   ok boot -r
   ```

11.3.4 Data cartridges

Use the data cartridges shown in Table 11.2 in this unit.

⚠CAUTION

Unit Damage/Data Destruction

Use only the recommended data cartridges. Use of a non-recommended data cartridge may cause the DAT drive to malfunction.

Table 11.2 DDS3 DAT Data cartridges

Part Name	Supplier	Qty.	Capacity (Format)	Tape Length
DG4-125M	Fuji Film	5 tapes	12 GB (DDS-3) (non-compressed)	125m
MS-4/120S(D)5P	Maxell	5 tapes	4 GB (DDS-2) (non-compressed)	120m
MS-4/90S(D)5P	Maxell	5 tapes	2 GB (DDS-1) (non-compressed)	90m
DG60P	Sony	5 tapes	1.3 GB (DDS-1) (non-compressed)	60m

11.3.5 Data cartridge handling precautions

⚠CAUTION

Unit Damage/Data Destruction

Note the following points when handling data cartridges.

Otherwise, the unit may be damaged or data may be lost.

- Avoid using or storing data cartridges in the following environments and locations:
  - Environments subject to extreme temperatures and humidity
  - Dirty environments (cigarette smoke, dust, corrosive gases, etc.)
  - Environments subject to sudden changes in temperature and humidity
  - Locations that are likely to adversely affect the magnetic tape material
  - Locations subject to sunlight
  - Locations subject to impact or vibrations
  - Locations near heating equipment
- When a data cartridge is not to be used for a long time, remove it from the DAT drive, and put it in its case. Store under the following conditions:

  Temperature: 5-32 deg. C (41-89 deg. F)

  Humidity: 20-60% (non-condensing)
- Do not spill coffee or other liquids over a data cartridge.
- Do not drop data cartridges on the floor or subject them to impact.
- Do not open the tape cover or turn the tape reel unnecessarily.
- Do not force data cartridges into the DAT drive.
- If the ambient temperature or humidity changes rapidly, wait for the data cartridge to adapt to the new conditions (at least one hour) before inserting it in the DAT drive.
- Each data cartridge has service life. This will vary according to the operating environment (temperature, humidity, dust, etc.) and condition of the DAT drive. Generally, replace data cartridges with new ones after they have been used 75 times or after one year of use, whichever occurs first.

11.3.6 Write-protecting a data cartridge

Data cartridges have a write-protection tab to protect important data from being overwritten by mistake.

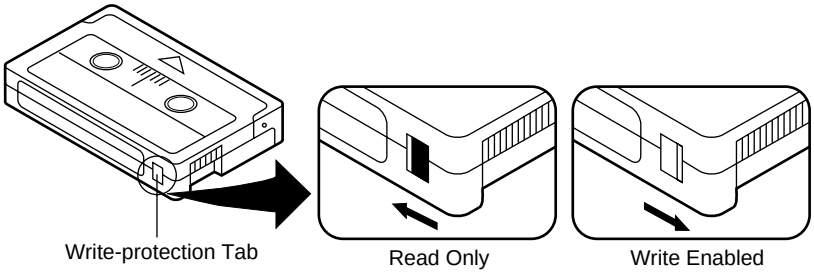


Figure 11.4 DAT Data Cartridge Write-protection Tab

11.3.7 Loading a data cartridge

1. Check that the Tape LED and Clean LED are both out.
   When the Tape LED is lit, this means that a data cartridge is already inserted.
2. Insert the data cartridge straight into the DAT drive.
   Once the data cartridge is partially inserted, it will be automatically drawn into the DAT drive.
3. When loading of the tape is complete, the Tape LED lights to indicate that DAT drive is ready for accessing.

11.3.8 Ejecting a data cartridge

1. Check that the Tape LED is not blinking (the DAT drive is not operating).
2. Press the Eject button.
   The tape is rewound and unloaded. The Tape LED will blink during this operation.
   When the tape has finished being rewound the data cartridge is ejected.
   It can take up to 120 seconds for a data cartridge to be ejected. After the tape is ejected, the Tape LED goes out.

11.3.9 Cleaning the tape heads

The following describes daily care, the cleaning cartridge and how to clean the tape heads.

Daily care

⚠CAUTION

Unit Damage/Data Destruction

The DAT drive reads and writes data using a magnetic head. This head becomes dirty due to dust, dirt and magnetic particles off the tape inside data cartridges. If you do not periodically clean the magnetic head using a cleaning cartridge, the unit may become damaged or data may be lost.

The tape heads must be cleaned:

- After the DAT drive has been used for more than 25 hours.
  (Generally, we recommend periodic cleaning, e.g. "Monday morning every week.")
- If one month has passed since the last head cleaning even if the DAT drive has not been used.
- Before you insert a brand new data cartridge.
- When the Clean LED starts blinking.
- If a cleaning instruction message is output on the console.
- After the magnetic head is automatically cleaned (a mechanical noise is audible) for several seconds by the cleaning brush inside the DAT drive.
  Note: This sound does not indicate mechanical trouble.

Cleaning cartridge

Use the following cleaning cartridge in this unit.

Table 11.3 DAT Cleaning Cartridge

Part Name	Supplier	Qty.
HS-4/CL(D)	Maxell	1 tape

Cleaning the tape heads

When a cleaning cartridge is inserted into the DAT drive in the same way as a data cartridge, head cleaning will start automatically. Head cleaning takes about 40 seconds. The cleaning cartridge is ejected automatically after cleaning is completed.

Replacing the cleaning cartridge

Replace the cleaning cartridge in the following instances:

- When it has been used 50 times (may vary if also used with other devices
- When all the tape has been wound up onto the right-hand reel (cleaning tape cannot be reused)
  (In this case, the cleaning cartridge is ejected within 20 seconds.)

11.4 DAT Drive (DDS4)

Note: DDS4 DAT drive can not be installed in the Expansion File Unit Type-2.

This section describes the following items:

- Names and functions of parts
- SCSI ID
- OS settings
- Data cartridges
- Data cartridge handling precautions
- Write-protecting data cartridges
- Loading data cartridges
- Ejecting data cartridges
- Cleaning the tape heads

11.4.1 Names and functions of parts

The following describes the names and functions of individual components of the DDS4 DAT drive.

Figure 11.5 shows the front panel of the DAT Drive.

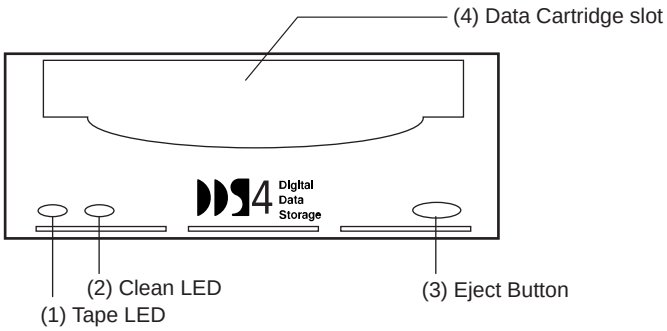


Figure 11.5 Front Panel of DDS4 DAT Drive

(1) Tape LED

This LED lights up (green) when a data cartridge is loaded, and blinks (green) when the DAT drive is operating.

For details, see Table 11.4 .

(2) Clean LED

When this LED starts blinking, the head of the DAT drive should be cleaned using a cleaning cartridge, or the data cartridge or the cleaning cartridge is near the end of its useful life.

The Clean LED also lights up (amber) if the DAT drive malfunctions.

For details, see Table 11.4 .

Table 11.4 DAT Drive LED Indicators

LED		DAT Drive Status
Tape	Clean	
Dark	Dark	Data cartridge is not loaded.
Lit		Data cartridge is loaded.
Blinking (1/2sec interval)		Tape is loading / unloading, or drive-diagnostics are running.
Blinking (1/4sec interval)		Accessing tape (Read / Write)
(any)	Lit	Drive has malfunctioned.
	Blinking (1/2sec interval)	Tape head cleaning is required, or needs replacing.

(3) Eject Button

⚠CAUTION

Data Destruction

Do not press the Eject button during operation (when the tape LED is blinking). If the Eject button is held down for about five seconds, the forced ejection function will execute, and any data being written may be lost.

Press the Eject button to remove the data cartridge. Before removing a data cartridge, make sure that the tape LED is out.

If the DAT Software (or operating system) has disabled removal of a data cartridge, the cartridge cannot be removed by pressing the Eject button.

(4) Data Cartridge Slot

⚠CAUTION

Never insert your fingers or other foreign objects in the data cartridge slot, as this may damage the unit or cause data to be lost.

11.4.2 SCSI ID

Set the SCSI ID of the DAT drive to "5".

11.4.3 OS settings

11.4.3.1 PRIMEPOWER200 Non-Pedestal Servers

Before using a DDS4 DAT drive, the /kernel/drv/st.conf file must be modified, as follows:

1 Copy the original st.conf file:

```
# cp /kernel/drv/st.conf /kernel/drv/st.conf.old
```

2 Add the following lines to the /kernel/drv/st.conf file:

```
tape-config-list =
           "HP        C5683A", "HP DDS4 4mm DAT", "HP_data2";
HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
```

IMPORTANT

There must be exactly six spaces between HP and C5683A. If another tape-config-list has already been defined, use a "," as a separator and add the new lines as shown in the following example.

```
Tape-config-list =
           "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC",
           "HP        C5683A", "HP DDS4 4mm DAT", "HP_data2";
EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;

HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
```

3 Shut the system down:

```
# shutdown -y i0
```

4 Then reboot the system, using the -r flag:

```
ok boot -r
```

11.4.3.2 PRIMEPOWER200 Pedestal Servers

Before using a DDS4 DAT drive, the /kernel/drv/st.conf file must be modified, and a /kernel/drv/glm.conf file created, as follows:

1. Copy the original st.conf file:

   ```
   # cp /kernel/drv/st.conf /kernel/drv/st.conf.old
   ```

2. Add the following lines to the /kernel/drv/st.conf file:

   ```
   tape-config-list =
              "HP        C5683A", "HP DDS4 4mm DAT", "HP_data2";
   HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
   ```

   IMPORTANT

   There must be exactly six spaces between HP and C5683A. If another tape-config-list has already been defined, use a "," as a separator and add the new lines as shown in the following example.

   ```
   Tape-config-list =
              "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC",
              "HP        C5683A", "HP DDS4 4mm DAT", "HP_data2";
   EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;

   HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
   ```

3. Create a /kernel/drv/glm.conf containing the following lines:

   ```
   name = "glm" parent = "/pci@17,4000"
   Unit-address = "3"
   target5-scsi-options = 0x1df8;
   ```

4. Shut the system down:

   ```
   # shutdown -y i0
   ```

5. Then reboot the system, using the -r flag:

   ```
   ok boot -r
   ```

6 Confirm the transfer rate (checking the glm.conf settings)

Use the "prtconf -v" command to check the value of the "target5-sync-speed" setting.

In the following example this is: 0x4e20(KB/sec) = 20000(KB/sec) = 20(MB/sec), confirming that the DDS4 is working at fast20 (Ultra SCSI) speed.

(A lower value may indicate incorrect settings.)

```
#prtconf -v
System Configuration: Sun Microsystems sun4us
Memory size: 9216 Megabytes
System Peripherals (Software Nodes):

FJSV,GPUS
   System properties:
      name <relative-addressing> length <4>
         value <0x00000001>.
...
            name <target5-sync-speed> length <4>
               value <0x00004e20>. ←Check this value!
...
```

11.4.4 Data cartridges

Use the data cartridges shown in Table 11.5 in this unit.

⚠CAUTION

Unit Damage/Data Destruction

Use only the recommended data cartridges. Use of a non-recommended data cartridge may cause the DAT drive to malfunction.

Table 11.5 DDS4 DAT Data cartridges

Part Name	Supplier	Qty.	Capacity (Format)	Tape Length
DG4-150M	Fuji Film	5 tapes	20 GB (DDS-4) (non-compressed)	150m
DG3-125M	Fuji Film	5 tapes	12 GB (DDS-3) (non-compressed)	125m
MS-4/120S(D)5P	Maxell	5 tapes	4 GB (DDS-2) (non-compressed)	120m
MS-4/90S(D)5P (∗)	Maxell	5 tapes	2 GB (DDS-1) (non-compressed)	90m

(∗): Read only for this drive

11.4.5 Data cartridge handling precautions

⚠CAUTION

Unit Damage/Data Destruction

Note the following points when handling data cartridges.

Otherwise, the unit may be damaged or data may be lost.

- Avoid using or storing data cartridges in the following environments and locations:
  - Environments subject to extreme temperatures and humidity
  - Dirty environments (cigarette smoke, dust, corrosive gases, etc.)
  - Environments subject to sudden changes in temperature and humidity
  - Locations that are likely to adversely affect the magnetic tape material
  - Locations subject to sunlight
  - Locations subject to impact or vibrations
  - Locations near heating equipment
- When a data cartridge is not to be used for a long time, remove it from the DAT drive, and put it in its case. Store under the following conditions:

  Temperature: 5-32 deg. C (41-89 deg. F)

  Humidity: 20-60% (non-condensing)
- Do not spill coffee or other liquids over a data cartridge.
- Do not drop data cartridges on the floor or subject them to impact.
- Do not open the tape cover or turn the tape reel unnecessarily.
- Do not force data cartridges into the DAT drive.
- If the ambient temperature or humidity changes rapidly, wait for the data cartridge to adapt to the new conditions (at least one hour) before inserting it in the DAT drive.
- Each data cartridge has long but limited service life. This will vary according to the operating environment (temperature, humidity, dust, etc.) and condition of the DAT drive. Generally, replace data cartridges with new ones after they have been used 75 times or after one year of use, whichever occurs first.

11.4.6 Write-protecting a data cartridge

Data cartridges have a write-protection tab to protect important data from being overwritten by mistake.

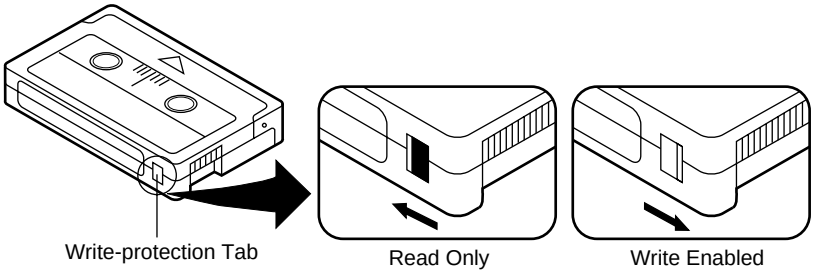


Figure 11.6 DAT Data Cartridge Write-protection Tab

11.4.7 Loading a data cartridge

1. Check that the Tape LED and Clean LED are both out.
   When the Tape LED is lit, this means that a data cartridge is already inserted.
2. Placing it against the shutter, insert the data cartridge straight into the DAT drive.
   Once the data cartridge is partially inserted, it will be automatically drawn into the DAT drive.
3. When loading of the tape is complete, the Tape LED lights to indicate that DAT drive is ready for accessing.

11.4.8 Ejecting a data cartridge

1. Check that the Tape LED is not blinking (the DAT drive is not operating).
2. Press the Eject button.
   The tape is rewound and unloaded. The Tape LED will blink during this operation.
   When the tape has finished being rewound, the shutter automatically opens, and the data cartridge is ejected.
   It can take up to 120 seconds for a data cartridge to be ejected. After the tape is ejected, the Tape LED goes out.

11.4.9 Cleaning the tape heads

The following describes daily care, the cleaning cartridge and how to clean the tape heads.

Daily care

⚠CAUTION

Unit Damage/Data Destruction

The DAT drive reads and writes data using a magnetic head. This head becomes dirty due to dust, dirt and magnetic particles off the tape inside data cartridges. If you do not periodically clean the magnetic head using a cleaning cartridge, the unit may become damaged or data may be lost.

The tape heads must be cleaned:

- After the DAT drive has been used for more than 24 hours.
  (Generally, we recommend periodic cleaning, e.g. "Monday morning every week.")
- If one month has passed since the last head cleaning even if the DAT drive has not been used.
- Before you insert a brand new data cartridge.
- When the Clean LED starts blinking.
- If a cleaning instruction message is output on the console.
- After the magnetic head is automatically cleaned (a mechanical noise is audible) for several seconds by the cleaning brush inside the DAT drive.
  Note: This sound does not indicate mechanical trouble.

Cleaning cartridge

Use the following cleaning cartridge in this unit.

Table 11.6 DAT Cleaning Cartridge

Part Name	Supplier	Qty.
HS-4/CL(D)	Maxell	1 tape

Cleaning the tape heads

When a cleaning cartridge is inserted into the DAT drive in the same way as a data cartridge, head cleaning will start automatically. Head cleaning takes about 40 seconds. The cleaning cartridge is ejected automatically after cleaning is completed.

Replacing the cleaning cartridge

Replace the cleaning cartridge in the following instances:

- When it has been used 50 times (may vary if also used with other devices
- When a it is not automatically ejected within one minute of being inserted
- When the Clean LED does not stop blinking even after the cleaning cartridge has been used
- When all the tape has been wound up onto the right-hand reel (cleaning tape cannot be reused)

11.5 8mm Tape Drive

This section describes the following items:

- Names and function of parts
- SCSI ID
- OS settings
- Data cartridges
- Data cartridge handling precautions
- Write-protecting data cartridges
- Loading data cartridges
- Ejecting data cartridges
- Cleaning the tape heads

11.5.1 Names and function of parts

Figure 11.7 shows the front panel of the 8mm tape drive.

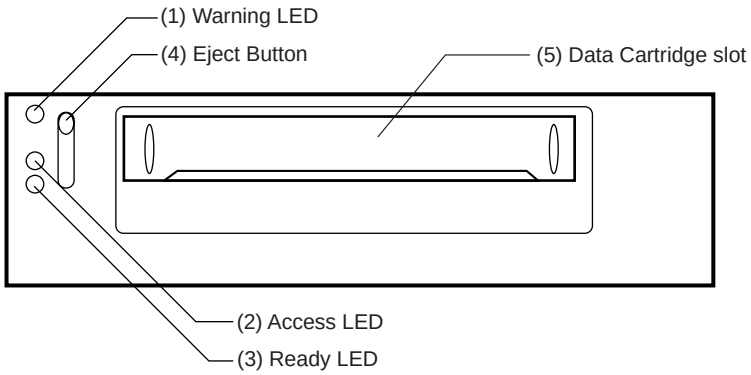


Figure 11.7 Front Panel of 8mm Tape Drive

(1) Warning LED

This LED blinks (amber) when an error occurs with the 8mm tape drive. The ready LED also blinks when the tape head must be cleaned.

The Warning LED lights up when power is turned on or self-diagnostics are being executed on the 8mm tape drive after a reset. For details, see table Table 11.7 .

(2) Access LED

This LED lights up (or blinks) (green) when the 8mm tape drive is running. It also lights up when power is turned on or self-diagnostics are being executed on the 8mm tape drive after a reset. For details, see table Table 11.7 .

(3) Ready LED

This LED lights up (green) when a data cartridge is in the tape drive (and loading has finished). This LED blinks when the 8mm tape drive is running, or when head cleaning is required or being performed. It also lights up when power are turned on or self-diagnostics are being executed on the 8mm tape drive after a reset. For details, see Table 11.7 .

Table 11.7 8mm Tape Unit LED States

Warning LED	Access LED	Ready LED	Tape Drive Status
Lit	Lit	Lit	Performing start-up diagnostics
Fast Blink	(any)	Dark	Diagnostic error has occurred
Dark	(any)	Dark	Data cartridge is not loaded
Dark	(any)	Lit	Data cartridge is loaded and idle
Dark	(any)	Slow Blink	Loading or running tape (normal speed)
Dark	(any)	Fast Blink	Loading/unloading or running tape (high speed)
Lit	Lit	Lit	SCSI bus is being reset
Slow Blink	(any)	Dark	Drive has malfunctioned
Fast Blink	(any)	Fast Blink	Tape heads require cleaning
Dark	(any)	Slow Blink	Tape heads being cleaned

(4) Eject Button

Press the Eject button to remove the data cartridge. Before removing a data cartridge, make sure that the Tape LED is out.

If the 8mm Tape software has disabled removal of a data cartridge, the cartridge cannot be removed by pressing the Eject button.

(5) Data Cartridge Slot

⚠CAUTION

Never insert your fingers or other foreign objects in the data cartridge slot, as this may damage the unit or cause data to be lost.

11.5.2 SCSI ID

Set the SCSI ID of the 8mm tape drive to "5" if it is the 1st drive in the PRIMEPOWER or the Expansion File Unit Type-2. Set the SCSI ID to "3" if it is the 2nd drive.

11.5.3 OS settings

Before using a 8mm tape drive, the /kernel/drv/st.conf file must be modified, as follows:

1 Copy as original st.conf file:

```
# cp /kernel/drv/st.conf /kernel/drv/st.conf.old
```

2 Add the following lines to the /kernetl/drv/st.conf file:

```
tape-config-list =
          "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC";
EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;
```

IMPORTANT

If another tape-config-list has already been defined, use a "," as a separator and add the new lines the file as shown in the following example.

```
Tape-config-list =
           "HP      C1537A", "HP DDS3 4mm DAT", "HP_data2",
           "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC";
HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;
```

3 Shut the system down:

```
# shutdown -y i0
```

4 Then reboot the system, using the -r flag

```
ok boot -r
```

Table 11.8 shows the data formats supported by this unit.

Table 11.8 Supported Data Formats (8mm Tape Drive)

Data Format	Read	Write	Note
EXB-8200	Yes	No	Write protect tab must be set ("read only")
EXB-8500	Yes	Yes	
EXB-8200c	No	No	
EXB-8500c	Yes	Yes	

When specifying the data format to be used by your 8mm tape unit, refer to the density codes in Table 11.9 :

Table 11.9 Density Codes When Specifying Data Formats

Data Format	Density Code	Special File (*)
EXB-8200	0x14 (14h)	/dev/rmt/ x l[n]
EXB-8500	0x15 (15h)	/dev/rmt/ x m[n]
EXB-8500c	0x8c (8ch)	/dev/rmt/ x c[n]

(*): A number, such as 0, will need to be specified at x in this column (the actual number will vary from system to system). [n] stands for no rewind.

11.5.4 Data cartridges

Use the following data cartridges in this drive.

⚠CAUTION

Unit Damage/Data Destruction

Use only the recommended data cartridges. Use of a non-recommended data cartridge may cause the 8mm tape drive to malfunction.

Table 11.10 8mm Data Cartridges

Part Name	Supplier	Qty.	Capacity	Tape Length
Exabyte 160mXL	Exabyte	5 tapes	7GB (non-compressed)	160m
HS-8/112(D)	Maxell	5 tapes	5GB (non-compressed)	112m

11.5.5 Data cartridge handling precautions

⚠CAUTION

Unit Damage/Data Destruction

Note the following points when handling data cartridges.

Otherwise, the unit may be damaged or data may be lost.

- Avoid using or storing data cartridges in the following environments and locations:
  - Environments subject to extreme temperatures and humidity
  - Dirty environments (cigarette smoke, dust, corrosive gases, etc.)
  - Environments subject to sudden changes in temperature and humidity
  - Locations that are likely to adversely affect the magnetic tape material
  - Locations subject to sunlight
  - Locations subject to impact or vibrations
  - Locations near heating equipment
- When a data cartridge is not to be used for a long time, remove it from the 8mm tape drive, and put it in its case. Store under the following conditions:

  Temperature: 5-32 deg. C (41-89 deg. F)

  Humidity: 20-60% (non-condensing)
- Do not spill coffee or other liquids over a data cartridge.
- Do not drop data cartridges on the floor or subject them to impact.
- Do not open the tape cover or turn the tape reel unnecessarily.

- Do not force data cartridges into the 8mm tape drive.
- If the ambient temperature or humidity changes rapidly, wait for the data cartridge to adapt to the new conditions (at least one hour) before inserting it in the 8mm tape drive.
- Each data cartridge has long but limited service life. This will vary according to the operating environment (temperature, humidity, dust, etc.) and condition of the 8mm tape drive. Generally, replace data cartridges with new ones after they have been used 150 times or after one year of use, whichever occurs first.

11.5.6 Write-protecting a data cartridge

Data cartridges have a write-protection tab to protect important data from being overwritten by mistake.

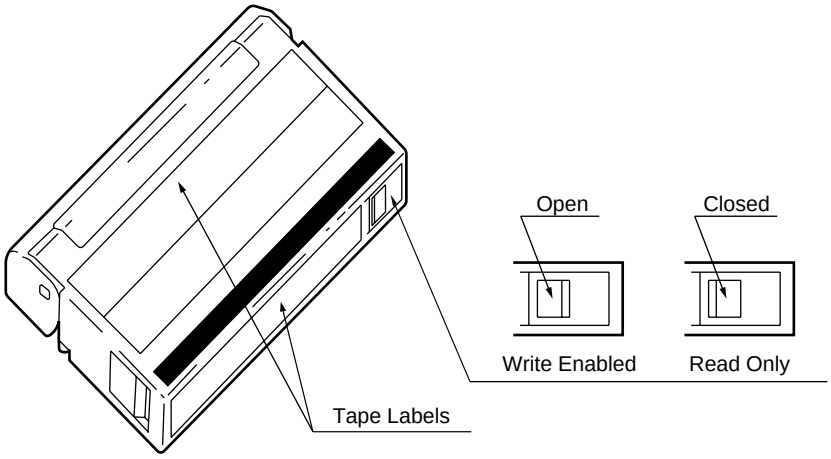


Figure 11.8 8mm Tape Drive Data Cartridge Write-protection Tab

11.5.7 Loading a data cartridge

1. Check that the Access LED and Ready LED are both out.
   When the Ready LED is lit, this means that a data cartridge is already inserted.
2. Insert the data cartridge straight into the 8mm tape drive.
   Once the data cartridge is inserted, it will be automatically drawn into the 8mm tape unit.
3. When loading of the tape is complete, the Ready LED lights to indicate that 8mm tape drive is ready for accessing.

If the data cartridge is not inserted straight, it will be automatically ejected. Reinsert it, making sure that it is straight.

11.5.8 Ejecting a data cartridge

1. Check that the Access LED is not blinking (the 8mm tape drive is not operating).
2. Press the Eject button.

   The tape is rewound and unloaded. The Ready LED will blink during this operation.

   When the tape has finished being rewound, the data cartridge is automatically ejected.

   After the tape is ejected, the Ready LED goes out.

11.5.9 Cleaning the tape heads

The following describes daily care, the cleaning cartridge, how to clean the tape heads, and when to replace the cleaning cartridge.

Daily care

⚠CAUTION

Unit Damage/Data Destruction

The 8mm tape unit reads and writes data using a magnetic head. This head becomes dirty due to dust, dirt and magnetic dust particles off the tape inside data cartridges. If you do not periodically clean the magnetic head using a cleaning cartridge, the unit may become damaged or data may be lost.

The tape heads must be cleaned:

- After the 8mm tape drive has been used for more than 30 hours.
  (Generally, we recommend periodic cleaning, e.g. "Monday morning every week.")
- If one month has passed since the last head cleaning, even if the 8mm tape drive has not been used.
- Before you insert a brand new data cartridge.
- When the Warning LED and Ready LED blink simultaneously.
- If a cleaning instruction message is output on the console.

Cleaning cartridge

Use the following cleaning cartridge in this unit.

Table 11.11 8mm Cleaning Cartridge

Part Name	Supplier	Qty.
HS-8/CL(D)	Maxell	1 tape

Other 8mm cleaning cartridges or equivalents should not be used in the 8mm tape drive. The 8mm tape drive will automatically eject other types of cleaning cartridge, without cleaning the tape heads.

Figure 11.9 shows the appearance of the cleaning cartridge.

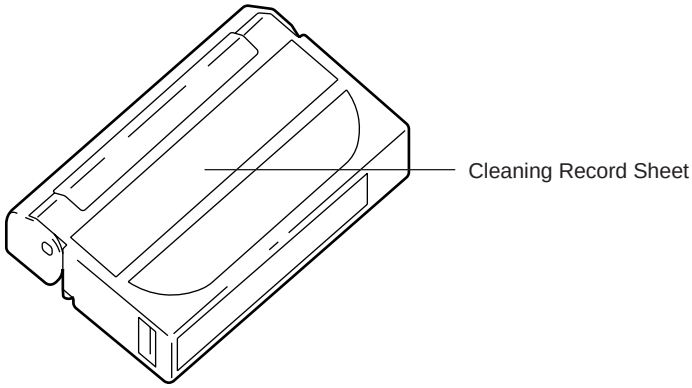


Figure 11.9 Appearance of Cleaning Cartridge

Cleaning the tape heads

When a cleaning cartridge is inserted into the 8mm tape drive in the same way as a data cartridge, head cleaning will start automatically. Head cleaning takes about one minute. The cleaning cartridge is ejected automatically after cleaning is completed.

Replacing the cleaning cartridge

Replace the cleaning cartridge in the following instances:

- When it has been used 18 times (may vary if also used with other devices
- When it is not automatically ejected within 40 seconds of being inserted
- When all the tape has been wound up onto the right-hand reel (cleaning tape cannot be reused)

11.6 DLT Tape Drive

Note: DLT drive can be installed in the PRIMEPOWER400 Rackmount (10U) Server, PRIMEPOWER400 Pedestal Server and PRIMEPOWER600 Server.

The following section describes the following:

- Names and functions of parts
- SCSI ID
- OS settings
- Data cartridges
- Data cartridge handling precautions
- Write-protecting data cartridges
- Loading data cartridges
- Ejecting data cartridges
- Cleaning the tape heads

11.6.1 Names and functions of parts

The following describes the names and functions of individual components of the DLT tape drive.

Figure 11.10 shows the front panel of the DLT tape drive.

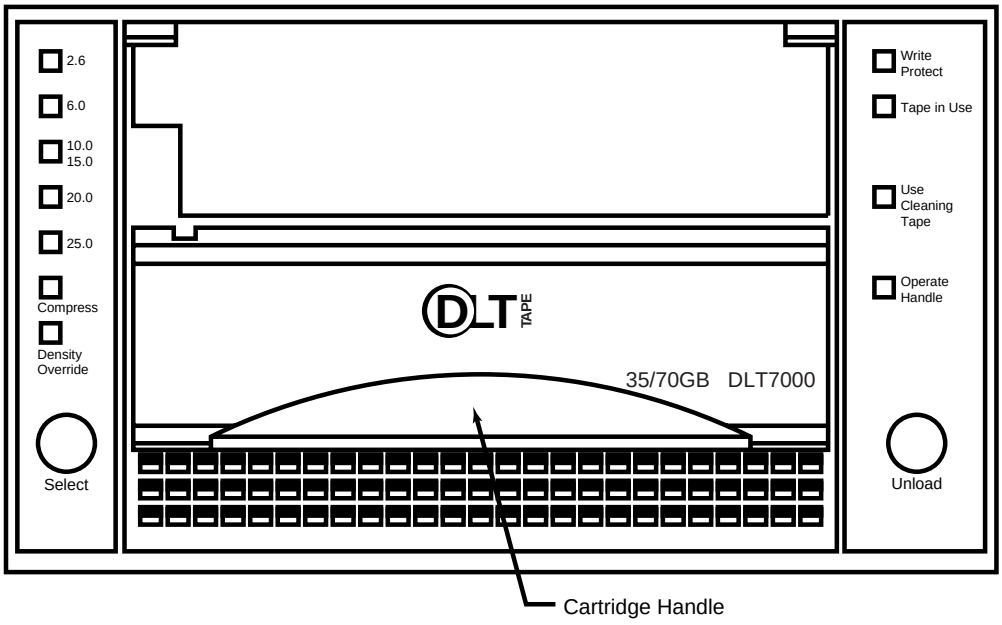


Figure 11.10 Front Panel of DLT Tape Drive

Left Side Controls		Right Side Controls	
2.6 LED	(Amber)	Write Protect LED	(Orange)
6.0 LED	(Amber)	Tape in Use LED	(Amber)
10.0/15.0 LED	(Amber)	Use Cleaning Tape LED	(Amber)
20.0 LED	(Amber)	Operate Handle LED	(Green)
35.0 LED	(Amber)		
Compress LED	(Amber)		
Density Override LED	(Amber)		
(Density) Select Button		Unload (Tape) Button	

LED / Button Name	State (Color)	Description	Note
2.6 LED 6.0 LED 10.0/15.0 LED	(Dark)	(Not currently used)	
20.0 LED 35.0 LED	Lit (Amber)	Record density of the loaded tape.	(See example below)
	Blinking (Amber)	Recording density to be used to write data (if different from the current format).	Set using the Select Button. (See example below)
Compress LED	Lit (Amber)	Compression mode is active.	Set using the Select Button.
	Dark	Compression mode is inactive (data will be written non-compressed).	
Density Override LED	Lit (Amber)	Data will be written using the recording density specified by the Select Button.	Set using the Select Button. If lit, the settings of the host software will be ignored.
	Blinking (Amber)	Select Button is being used to set the recording density.	
	Dark	Data will be written using the recording density specified by the host software.	
Select Button	---	Use to manually set the compression mode (compressed/non-compressed) and recording density (20.0/35.0).	
Write Protect LED	Lit (Orange)	Loaded tape is set to "read only".	
	Dark	Loaded tape may be written to.	
Tape in Use LED	Lit (Amber)	Tape is loaded (and idle) in the drive unit.	
	Blinking (Amber)	Tape is moving or drive unit is performing diagnostics.	
	Dark	No tape is currently loaded.	
Use Cleaning Tape LED	Lit (Amber)	Tape heads require cleaning.	For details, see ⁄9.6.9 "Cleaning the tape heads".
Operate Handle LED	Lit (Green)	Cartridge handle can be used to eject the loaded tape.	
	Dark	Cartridge handle cannot be currently operated.	
Unload Button	---	Pressing readies the loaded tape for ejection.	For details, see ⁄9.6.8 "Ejecting a data cartridge".
All 7 Left-hand LEDs or All 4 Right-hand LEDs	Lit	POST diagnostics are running.	
	Blinking	Fault detected.	If reboot does not clear fault, contact a CE for help.

(Example)

When the loaded tape has previously been recorded at 20.0GB, if the Select Button is used to set the recording density to 35.5 GB, and new data is recorded on the tape, then the Indicator LEDs will change as follows:

Before recording:	20.0 LED = Lit	35.5 LED = Blinking	Density Override LED = Lit
After recording:	20.0 LED = Dark	35.5 LED = Lit	Density Override LED = Lit

11.6.2 SCSI ID

Set the SCSI ID of the DLT tape drive to "5".

11.6.3 OS settings

Before using a DLT tape drive, the /kernel/drv/st.conf file must be modified, as follows:

1. Copy the original st.conf file:

   ```
   # cp /kernel/drv/st.conf /kernel/drv/st.conf.old
   ```

2. Add the following lines to the /kernel/drv/st.conf file:

   ```
   tape-config-list =
              "QUANTUM DLT7000","QUANTUM DLT7000","DLT7k-data";
   DLT7k-data = 1,0x36,0,0xD639,4,0x82,0x83,0x84,0x85,2;
   ```

   IMPORTANT

   If another tape-config-list has already been defined, use a "," as a separator and add the new lines as shown in the following example.

   ```
   Tape-config-list =
              "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC",
              "QUANTUM DLT7000","QUANTUM DLT7000","DLT7k-data";
   EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;
   DLT7k-data = 1,0x36,0,0xD639,4,0x82,0x83,0x84,0x85,2;
   ```

3. Shut the system down:

   ```
   # shutdown -y i0
   ```

4. Then reboot the system, using the -r flag:

   ```
   ok boot -r
   ```

11.6.4 Data cartridge

Use the data cartridge shown in Table 11.12 in this unit.

⚠CAUTION

Unit Damage/Data Destruction

Use only the recommended data cartridges. Use of a non-recommended data cartridge may cause the DLT drive to malfunction.

Table 11.12 DLT Data Cartridges

Part Name	Supplier	Qty.	Capacity (Format)
DLT tape IV	Fuji Film	5 tapes	35 GB (non-compressed)

11.6.5 Data cartridge handling precautions

⚠CAUTION

Unit Damage/Data Destruction

Note the following points when handling data cartridges.

Otherwise, the unit may be damaged or data may be lost.

- Avoid using or storing data cartridges in the following environments and locations:
  - Environments subject to extreme temperatures and humidity
  - Dirty environments (cigarette smoke, dust, corrosive gases, etc.)
  - Environments subject to sudden changes in temperature and humidity
  - Locations that are likely to adversely affect the magnetic tape material
  - Locations subject to sunlight
  - Locations subject to impact or vibrations
  - Locations near heating equipment
- When a data cartridge is not to be used for a long time, remove it from the DLT tape drive, and put it in its case. Store under the following conditions:

  Blank Tapes

  Temperature: 16-32 deg. C (61-89 deg. F)

  Humidity: 20-80% (non-condensing)

  Data Tapes

  Temperature: 18-28 deg. C (65-82 deg. F)

  Humidity: 40-60% (non-condensing)
- Do not spill coffee or other liquids over a data cartridge.
- Do not drop data cartridges on the floor or subject them to impact.
- Do not open the tape cover or turn the tape reel unnecessarily.
- Do not force data cartridges into the DLT tape drive.
- If the ambient temperature or humidity changes rapidly, wait for the data cartridge to adapt to the new conditions (at least one hour) before inserting it in the DLT tape drive.
- Each data cartridge has long but limited service life. This will vary according to the operating environment (temperature, humidity, dust, etc.) and condition of the DLT tape drive.

  If the Use Cleaning Tape LED lights immediately when a data cartridge is loaded just after cleaning was performed, this indicates that the data cartridge is damaged. Replace with a new data cartridge.

11.6.6 Write-protecting a data cartridge

Data cartridges have a write-protection tab to protect important data from being overwritten by mistake.

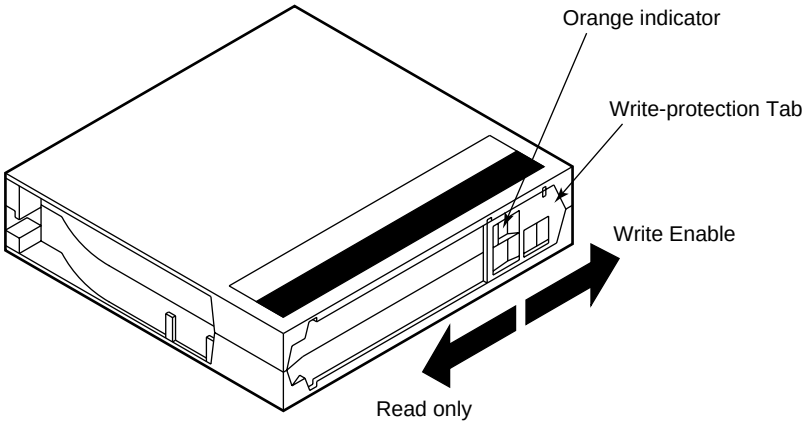
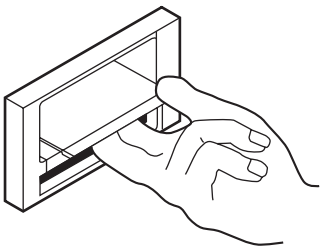


Figure 11.11 Data Cartridge Write-protection Tab

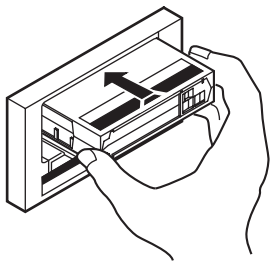
11.6.7 Loading a data cartridge

The following describes how to load data cartridges.

1 Check that the Operate Handle LED (green) is lit, and lift the cartridge handle up.

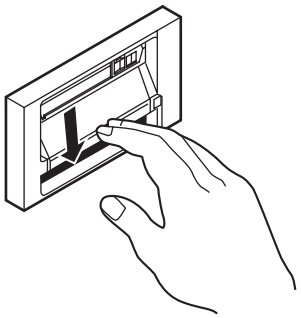


2 Push in the data cartridge straight into the DLT tape drive, making sure it is facing the right direction.



3 Lower the cartridge handle.

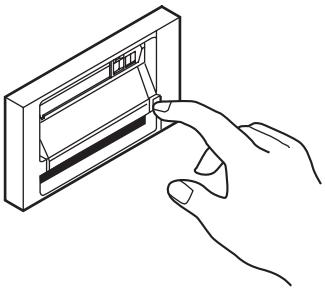
The Operate Handle LED goes out, and the Tape in Use LED starts to blink. When the Tape in Use LED (amber) stops blinking and lights up, this indicates that the tape has been mounted.



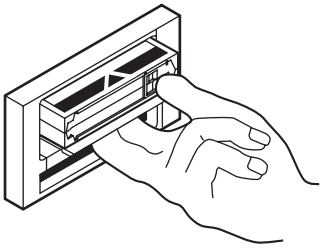
11.6.8 Ejecting a data cartridge

The following describes how to eject data cartridges.

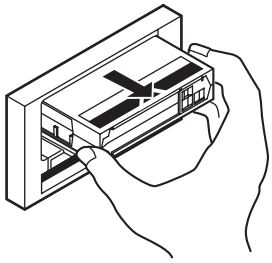
1 Press the Unload switch on the right of the front panel. The Tape in Use LED (amber) blinks, and the tape starts to rewind.



2 When the Operate Handle LED (green) lights up and the buzzer sounds, lift up the cartridge handle.



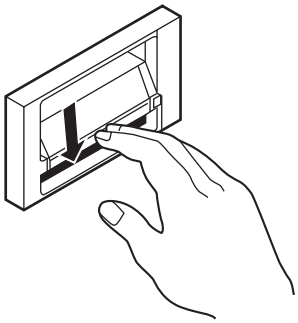
3 After lifting up the cartridge handle wait at least two seconds before removing the data cartridge.



⚠CAUTION

If you remove the data cartridge immediately after lifting up the handle, the leading section of the tape may be damaged.

4 Lower the cartridge handle.



11.6.9 Cleaning the tape heads

The following describes daily care, the cleaning cartridge and how to clean the tape heads.

Daily care

⚠CAUTION

Unit Damage/Data Destruction

The DLT tape drive reads and writes data using a magnetic head. This head becomes dirty due to dust, dirt and magnetic particles off the tape inside data cartridges. If you do not clean the magnetic heads when the Use Cleaning Tape LED lights up, the unit may become damaged or data may be lost.

The tape heads must be cleaned:

- Before you insert a brand new data cartridge.
- When the Use Cleaning tape LED (amber) at the right of the front panel lights up or starts blinking.
- If a cleaning instruction message is output on the console.

Cleaning cartridge

Table 11.13 DLT Cleaning Cartridge

Part Name	Supplier	Qty.
DLT Cleaning Tape III	Maxell	1 tape

Cleaning the tape heads

1. Make sure that Operate Handle LED (green) is lit before raising the cartridge handle.
2. Insert the cleaning cartridge.
3. Push the cleaning cartridge in.
4. Lower the cartridge handle.
5. The Operate Handle LED goes out and the Tape in Use LED starts to blink, and cleaning is automatically executed.
6. When cleaning is completed, the Operate Handle LED lights up.
7. Lift up the cartridge handle.
8. After lifting up the cartridge handle wait at least two seconds before ejecting the data cartridge.
9. Lower the cartridge handle.

Replacing the cleaning cartridge

Replace the cleaning cartridge in the following instances:

- When it has been used 20 times (may vary if also used with other devices)
- When the Use Cleaning Tape LED does not go out even after the cleaning cartridge has been used.

12

RCI Commands

CONTENTS

12.1 Overview 228
12.2 RCI Commands 228

12.1 Overview

By connecting I/O units to the PRIMEPOWER via the remote server unit interface (RCI), power supply to the I/O units can be slaved to the PRIMEPOWER Server power supply. The RCI also notifies the PRIMEPOWER Server of any errors that occur in I/O units.

RCI commands are used to display RCI configuration information and to set node addresses.

When adding an RCI port equipped I/O device, connect using to supplied RCI cable and perform set-up using the RCI commands.

12.2 RCI Commands

This section provides a list of RCI commands, a display example, and describes how to use RCI commands.

List of commands

Table 12.1 List Of Commands

Command	Function
rci-config	This command displays the RCI configuration information. Use this command to check that the host and I/Os are correctly set after making the RCI setting.
rci-config n m	This command is for entering the RCI configuration information. n stands for I/O node address, and m for the number of host nodes. Set so that the relationship n=m is established.
rci-configio-init	This command is for setting and incorporating the RCI configuration information when the RCI connections of the I/O devices are initially made.
rci-configio	This command is for setting and incorporating the RCI configuration information when adding or deleting nodes later on.

Command display example

The display is as follows when the rci-config command is executed:

```
ok rci-config
HOST:
addres: 000101ff mode: 010038a0 status: c000
LIST:
address     status   device-class   sub-class
000101ff    90       0001           01
000301ff    90       0100           01
000302ff    90       0201           01
```

Example of how to use commands

Set the MODE switch on the PRIMEPOWER Server to MANUAL and connect the RCI cable. Then turn the power on and enter the following commands from the ok prompt.

- To initially connect units, enter the following commands:

  ```
  ok rci-config 1 1
  ok rci-configio-init
  ```

- To add I/O units later on, enter the following command:

  ```
  ok rci-configio
  ```

- To add host nodes, enter the following commands:

  ```
  ok rci-config n m
  ok rci-configio
  ```

  Where "n" is the node address of the connected I/O, and "m" is the number of host nodes.

After making the above settings, execute the rci-config command to check that the settings have been made correctly. After set-up is complete, return the MODE switch to the regular operation setting (AUTO or SECURE).

13

Troubleshooting

CONTENTS

13.1 Overview 232
13.2 Checking Errors from the ok Prompt 232
13.3 LCD Initial Diagnostics Sequence 233
13.4 SCF Error Messages 234
13.5 Post Error Messages 237

13.1 Overview

How to isolate system trouble when it occurs varies according to the conditions in which the units were operating and the type of trouble.

- The LCD panel shows any hardware error messages found during POST diagnostics or hardware errors detected by the SCF while the system is running.
- The results of the POST diagnostics can be confirmed from the ok prompt is.
- If a system problem occurs while the operating system is running, an error message is displayed on the console and that error message is saved in the /var/adm/messages file. The various I/O units can be diagnosed by using the hardware diagnostics programs. These programs are contained in the "Enhanced Support Facility."

This chapter will give some tips to isolate hardware problems when trouble occurs.

IMPORTANT

Users should never attempt to repair the PRIMEPOWER themselves. Contact a service engineer for repairs.

When the service engineer performs repairs, logging in at the system administrator level is sometimes required. Please respond to the service engineer’s requests for logging in.

13.2 Checking Errors from the ok Prompt

After the POST (Power On Self Test) phase, entering the command shown in Table 13.1 from the ok prompt will show the hardware configuration and the results of POST diagnostics. It takes a little time for the screen to appear on the console after the power is turned on. If nothing appears on the console even after the power has been turned on for a while, check the messages on the LCD panel, the state of the CHECK and POWER LEDs, and the console connections.

Display of initial diagnostics results

Enter the command shown in Table 13.1 to display the results of the POST diagnostics.

Table 13.1 show-post-results Command

Command	Function
show-post-results	Displays the results of diagnostics on the UPA clock, UPA module, PCI slots, memory modules and on-board I/O on the console.

Also, the diagnostic results can be referred to by using the prtdiag (1M) command while the operating system is running.

13.3 LCD Initial Diagnostics Sequence

LCD panel sequence

Figure 13.1 shows the major messages that are displayed on the LCD panel during the PRIMEPOWER start-up process. These messages will appear in the order indicated.

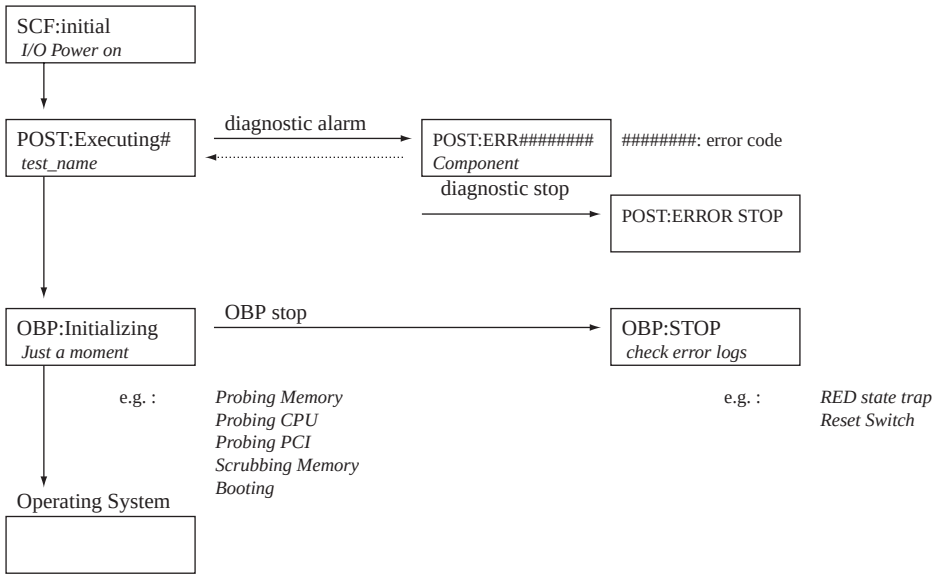


Figure 13.1 Initial Diagnostics Sequence

If power-on processing does not start after the power switch is turned on, check that the power cable is properly connected to the AC power inlet, and that the MODE switch is set to SECURE.

13.4 SCF Error Messages

The following table shows the messages that most commonly appear on the LCD panel when the SCF System detects an error. Messages other than those shown may sometime be displayed.

SCF power supply unit configuration errors

The messages shown in Table 13.2 are displayed if there is a problem in the power supply unit configuration.

Table 13.2 Power Supply Unit Configuration Error Messages

Message (1st line)	Message (2nd line)	Cause
SCF:alarm	FEP Config	Insufficient FEP (Front End Power) units.
	0x-DDC Config	Insufficient DDC (DC-DC Converter) units or DDC units inserted in incorrect slots.
	PPU3 Config	Insufficient 3.3V PPU.
	PPU5 Config	Insufficient 5.0V PPU.
	PPU12 Config	Insufficient 12.0V PPU.
SCF:warning	0X-DDC Config	Excess DDC units.
	PPU3 Config	Excess 3.3V PPU.
	PPU5 Config	Excess 5.0V PPU.
	PPU12 Config	Excess 12.0V PPU.

Power supply unit, fans, environmental monitoring

The messages shown in Table 13.3 are displayed if an error is detected in the power supply units, fans or temperature while the system is running.

Table 13.3 Power Supply Unit, Fans, and Environmental Error Messages

Message (1st line)	Message (2nd line)	Cause
SCF:warning	FAN x-y FAN x-y (m-n)	Error detected at fan #y of fan tray #x. (m-n): Multiple events detected.
	FEP#x FEP#x (#y)	Abnormality detected at FEP #x. (#y): Multiple events detected.
SCF:alarm	FAN x-y FAN x-y (m-n)	Fault detected at fan #y of fan tray #x. (m-n): Multiple events detected.
	Thermal Inlet	Abnormal ambient temperature detected (exceeding approx. 40ßC / 104ßF).
	Thermal CPU	Abnormal CPU temperature detected.
	Sensor Inlet	Abnormal temperature sensor detected.
	FEP#x FEP#x (#y)	Abnormality detected at FEP #x. (#y): Multiple events detected.
	0x-DDC#y	Abnormality detected at DDC #x.
	PPU3#x	Abnormality detected at 3.3V PPU #x.
	PPU5#x	Abnormality detected at 5V PPU #x.
	PPU12#x	Abnormality detected at 12.0V PPU #x.
	FEP DC-ON 0x	Failed to power-on FEP #x.
	0x-DDC DC-ON xx	Failed to power-on DDC #xx.
	PPU2 DC-ON 0x	Failed to power-on 2.5V PPU #x.
	PPU3 DC-ON 0x	Failed to power-on 3.3V PPU #x.
	PPU5 DC-ON 0x	Failed to power-on 5.0V PPU #x.
	PPU12 DC-ON 0x	Failed to power-on 12.0V PPU #x.

Processor monitoring error messages

The messages shown in Table 13.4 are displayed if an error is detected by the CPU monitor during POST diagnostics or while the system is running.

Table 13.4 CPU Monitor Error Massages

Message (1st line)	Message (2nd line)	Cause
SCF:alarm	CPU Hangup xx	Processor hang-up detected in power-on processing phase xx.
	CPU Hangup 00xx	Processor hang-up detected in system operating environment xx.

Lithium battery

The messages shown in Table 13.5 are displayed when the voltage of the lithium battery has dropped. Also, an alarm message notifying initialization of the calendar information will be displayed when the power is turned on after replacing the lithium battery. If these messages are not cleared after replacing the lithium battery, a poor battery cable connection is the probable cause.

Table 13.5 Lithium Battery Error Messages

Message (1st line)	Message (2nd line)	Cause
SCF:alarm	LiBATT	The voltage of the lithium battery has dropped.
SCF:warning	Calendar Initial	The calendar information has been reset. This message is displayed immediately after the lithium battery is replaced.

Other error messages

Table 13.6 Other Error Massages

Message (1st line)	Message (2nd line)	Cause
SCF:idling...	xxx min. POWER	xxx minutes passed since the power was restored.
	RCI Mainte Mode	The RCI mode has changed for maintenance.
	I/O Power on	Waiting for I/O units to power up.
SCF:warning	Please Levelup	Firmware upgrade processing failed. Please try again.
SCF:alarm	RCI Timeout	Time-out detected by RCI communications.
	FMEM Protected	Mounted flash memory is write-protected.
	Syshalt xxxxxxxx	System HALT detected.
	0x-CPU Config	Mixed CPU types detected.
	I2C#x	I2C diagnostics (x: I2C bus number).
SCF:stop	SCF Watchdog	SCF watchdog detected.
	BUSerr xxxxxxxx	Bus error detected.
	ADRerr xxxxxxxx	Address error detected.

13.5 Post Error Messages

Table 13.7 shows the names of typical components that are displayed on the LCD panel when POST detects an error.

Table 13.7 Post Error Messages

Message (2nd line)	Location of Error	Part to Replace
0x-CPU#y	CPU module	CPU module in CPU slot #y on Systemboard #x.
0x-SLOT#yy	Memory module	Memory module in memory slot #yy on Systemboard #x.
Mem config error	Misconfigured memory module(s)	Memory module(s) inserted in incorrect slots.
0x-U2P(Timer)#y	Counter timer	Systemboard #x.
0x-U2P#y	PCI interface	Systemboard #x.
00-SCSI#x	SCSI interface	Systemboard #0.
00-PCIO(LAN)	Ethernet interface	Systemboard #0.
00-SuperIO(KB)	Keyboard interface	Systemboard #0.
00-SuperIO(Mouse)	Mouse interface	Systemboard #0.
00-SuperIO(FDC)	Floppy disk interface	Systemboard #0.
00-ESCC(TTY)	Serial interface	Systemboard #0.
0x-PCI#y	PCI slot or PCI card in PCI slot	Systemboard #x itself or PCI card in PCI slot #y on Systemboard #x.
0x-TOD/NVRAM	NVRAM chip	NVRAM chip on Systemboard #x.

14

Glossary

CONTENTS

14.1 Glossary 240

14.1 Glossary

Baud (Rate)

A unit of modulation speed, that reflects the number of elements occurring per second. One element per second gives a 1 baud modulation, while two hundred elements per second (1 element = 5ms) gives a 200 baud modulation. In the field of communications, the baud rate is often used interchangeably with the number of signal bits per second (bps).

Branch Prediction

Branching occurs after the CPU evaluates a conditional command, or after it receives an external input (interrupt). Normally, data is fed to the CPU in order of execution, but a branch means that the instructions that have already been fed into the pipeline have to be flushed, and the CPU must wait for the required instructions to be loaded before it can proceed. In extreme cases this can be a considerable drain on performance, so rather than blindly feeding data to the CPU in order of reception, if the presence of upcoming potential branches is noted, data can be preloaded into the cache, and each branch followed by the sequence of instructions calculated as being most likely to be called after the branch. Of course sometimes the prediction will be wrong and data will still have to be flushed and reloaded, but the more accurate the prediction, and the better the preloading, the lower the performance penalty becomes.

Bus (Line)

A path (circuit, signal line, etc.) or set of paths that is capable of transferring a signal, usually between components within the system (e.g. CPU <=> memory) or a system component and a peripheral device (e.g. CPU <=> hard disk).

Bus Protocol

The (predefined) logical structure and timing of the signals that are passed over a bus.

Cache (Primary or L1 Cache)

In order to prevent a fast CPU from having to wait for access to the relatively slow external memory, a small amount of very fast memory is often included within the CPU itself, and frequently used data and instructions are stored in this level one (L1) cache memory.

Cache (Secondary or L2 Cache)

Although very fast, L1 cache is also very expensive, and it is often impractical to add large amounts of it to the CPU design. However, it is relatively easy to add more fast memory close to, but not in the CPU, and this level two (L2) cache memory, while slower (and usually larger) than the L1 cache, is faster than the main memory, for improved system performance.

Checksum

A hash value calculated (e.g. using parity) in some way from a set of data, and then appended to it or compared with a previously appended checksum in order to validate the integrity of the data set (after transmission, retrieval from storage, etc.). Basically, even the most minor change to the data will produce a different checksum value, hence an error can be flagged if the calculated and transmitted/retrieved checksum values do not match.

Console (Terminal)

A device that allows the operator to communicate with and control the computer. A keyboard and display are standard, but other I/O devices are also sometimes used.

Data Packet

A sub-set of the data (including control signals) that forms a single transmission unit.

Disk Drive Bay

A (metal) frame affixed inside the server or a standalone cabinet that is designed to accept a hard disk drive (or other, similarly sized device, e.g. CR-ROM drive, etc.).

Disk Drive Cage

A rack of disk drive bays in the server or a standalone cabinet.

Disk Formatting

Before data can be read from/written to a hard disk, the disk must have (or be given) an underlying logical structure, or format, that the OS is able to recognize.

FEP (Front End Power unit)

The server's AC-DC power supply.

Hot-swapping

The ability to take down, remove, replace, and bring back up individual components of the system without having to shut the system down. This allows maintenance and replacement of defective parts to be performed even while the system continues to run, a vital ability for 24/7/365 hardware.

MAC (Media Access Control) Address

A physical (hardware) address that uniquely identifies each node of a network. For IEEE 802.3 and Ethernet networks, it is defined as 48 bits long, with the first 24 bits being the OUI, a unique hardware manufacturer's ID assigned by the IEEE, and the final 24 bits assigned as each manufacturer sees fit. The absolute uniqueness of each MAC address is an important feature, and the ROM or EPROM in most LAN devices contains such a MAC address, preventing the LAN from being illicitly modified. A MAC address is usually represented as a string of six hexadecimal octets: 00-40-41-84-2B-2C or 00:40:41:84:2B:2C.

Memory Dump

The raw contents of a specified section of the main memory, output in hexadecimal (or the ASCII equivalent thereof) for use in debugging.

Memory Interleaving

For speedier memory access, blocking due to wait states can be reduced by splitting the main memory into multiple banks, making areas of memory other than that currently being addressed more accessible. This is effective for sequential memory accesses, but gives no advantage for random accesses.

Mirroring

Modern hard disks are highly reliable, but even so a variety of methods are used to ensure the survival of your vitally important data, even if a disk failure does happen. One of the simplest methods is mirroring, which basically involves keeping two copies of all data saved to the hard disk. In this way, even if one copy is lost, the other will remain, ensuring that no data is lost.

Parity Checking

A method of checking the integrity of transmitted or stored data. The number of ones or zeroes in a binary data segment is used to calculate a parity bit which is appended to that piece of data. If the same calculation at a later time produces a parity bit that does not match the previously assigned parity bit, we can know that the value of at least one of the bits has changed, and the data can be rejected as corrupt. This works if only 1 (or other odd number) bit changes, but if 2 bits (or other even number) bits change then the calculated parity bit will match the previously assigned parity bit, meaning the errors will not be detected. This means that while parity can be used if errors are infrequent (and hence the probability of two errors is minuscule), it should be avoided if errors are rather more common.

PCI (Peripheral Component Interconnect)

A local (system) bus standard that provides (relatively) fast access to the CPU for a (relatively) small number of (peripheral) devices.

PCI Bus #

PCI slots listed as having the same PCI Bus number will share CPU access over the same PCI bus.

PPU (Power Processing Unit)

An internal (on-board component) type of power supply.

RCI (Remote Cabinet Interface)

A standard method of connecting multiple hosts to multiple I/O devices. The RCI provides power on/off, system control, system monitoring, inter-host communication, and various other functions.

RCI Node Address

A logical address assigned to each node of a RCI network.

SCF (System Control Facility)

Dedicated circuitry (including an independent CPU, the Service Processor) on the systemboard that provides unified monitoring and control of the status of cooling fans, power supplies, other system components and peripheral devices.

SCSI (Small Computer Systems Interface)

A fast, 8-bit parallel, ANSI standard I/O bus that can be used to connect up to 8 peripheral devices (hard disks, CR-ROM drives, MO drives, etc.) to a computer.

SCSI ID #

A unique address (0-7) assigned to each device on the SCSI bus.

Service Processor

The independent CPU that monitors the system and supplies diagnostic functions, as part of the SCF.

SMP (Symmetrical Multi-Processing)

A common method for using multiple processors together in a basically identical fashion.

Start and Stop Bits

In serial communications, special signals respectively mark the beginning and end of transmission of a set of data.

Ultra SCSI

An implementation of SCSI-3 that is twice as fast as FastSCSI.

UPS (Uninterruptible Power Supply)

An energy storage device that is able to continue supplying the rated power for the rated time if the normal AC power supply is interrupted.